American Forests

Entered as second-class matter at the Post-Office at Washington, D. C., under the Act of March 3, 1879. Acceptable for mailing at special rate of postage provided in Section 1103, Act of October 3, 1917, authorized July 10, 1918. Additional Entry at Baltimore, Md., December 29, 1931.

Photograph by Ernest C. Oberholtzer

October Sunrise at Grand Portage, Minnesota.

OVID BUTLER
EDITOR
L. M. CROMELIN and ERLE KAUFFMAN, Assistant Editors

Published Monthly by
THE AMERICAN FORESTRY ASSOCIATION
919-17th STREET, N. W.
WASHINGTON, D. C.

35 CENTS A COPY
$4.00 A YEAR

AMERICAN FORESTS

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VOLUME 42 — OCTOBER, 1936 — NUMBER 10

CONTENTS

THE COVER
Evening With the Trail Riders in Camp, in the Wind River Wilderness of Wyoming
Photograph by G. H. COLLINGWOOD

UNCLE SAM BUYS SOME FORESTS
By L. F. KNEIPP 443

CONFESSIONAL
Poem by ANNE SUTHERLAND 444

AFTER THE FLOODS
By HARLAN H. BARROWS 447

WITH THE TRAIL RIDERS OF 1936 449

RAVEN'S NEST
By CARLOS C. CAMPBELL 454

HERDS IN SAN SIMON
By WILL C. BARNES 456

EDITORIAL
Forest Protection—Past and Future 458

FLOOD CONTROL FEATURED BY CONFERENCE 459

MUST THEY STARVE?
By BEN EAST 463

REDWOOD (Tree Series) 466

FIELD AND FOREST FOR BOYS AND GIRLS
Master Bullfrog
By HARRY EDWARD MILLER 468

TREES AND THEIR USES
No. 18—Redwood
Drawn by CALVIN FADER 469

AROUND THE STATES 470

SAPLING SAM'S COLUMN 477

BOOK REVIEWS 479

ASK THE FORESTER 480

TRAIL MULE
Poem by ETHEL DIETER 482

"WHO'S WHO" AMONG OUR AUTHORS 488

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Member A. B. C.

Uncle Sam, owner of forest lands vital to the future growth and security of the nation, acquired this tract of Beech and Hemlock in what is now the Allegheny National Forest in Pennsylvania, established as a definite factor in the flood control program — designed to protect large centers of population in the east from flood danger. This forest is located on the watersheds of the Allegheny River.

AMERICAN FORESTS

Vol. 42 OCTOBER, 1936 No. 10

UNCLE SAM BUYS SOME FORESTS

How the Weeks Law of Twenty-Five Years Ago is Building up a Great System of National Forests in the East

By L. F. KNEIPP

Photographs by the United States Forest Service

THE second half of the nineteenth century had been an era of public land disposal, dominated by the idea that the public interest would be best served by transferring public lands to private ownership and placing them on the tax roll with all possible dispatch. The widely accepted theory was that only through private ownership and management would such lands contribute to economic life and social progress.

The law of March 3, 1891, authorizing withdrawals of public lands for forest reserves provoked indignant protests, not mollified by the ensuing act of June 4, 1897, designed to authorize orderly utilization of the withdrawn forest lands. There was only reluctant recognition of the logic of those laws; that the lands belonged to the government which was not irrevocably committed to a policy of complete disposal; that not having been taxable, their withdrawal deprived the local agencies of government of nothing but a part of their dreams of ultimately swollen assessment rolls.

Then, just as the century was drawing to a close, a public spirited group, viewing the future with prophetic accuracy, made a proposal regarded by almost all as radical, by some as revolutionary. They had the courage, or the temerity, to suggest that some of the funds contributed by the nation's taxpayers be used by Uncle Sam to make himself the proprietary owner and manager of certain forest lands, which in private ownership seemed doomed to the destruction not only of their own but also of related social and economic values, vital to the future growth and security of the nation.

The idea aroused instant opposition. Many believed, doubtless in all sincerity and good faith, that such action by the Federal Government would violate all concepts and principles of American democracy and the sovereign rights of the states. As many times has been the case, the constitution promptly was resorted to as the shield and sword with which to resist the threatened invasion of personal and political prerogatives. A full dozen years were to elapse before the ensuing processes of conventions, conferences, committee hearings, debates and carefully worded analyses of constitutional powers and limitations culminated in the passage by Congress of the law of which the Silver Jubilee is now being celebrated. But all circumstances considered, it was a strikingly impressive illustration of the workings of American principles of government.

This year—1936—the nation is celebrating the Silver Jubilee of the Weeks Law—an Act passed by Congress on March 1, 1911, launching the Federal Government upon a program of establishing a system of National Forests in the East. Because of its far-reaching effects on the forest lands of the East, and on forest conservation in general, the Act has been hailed as one of the most important pieces of forest legislation in the history of the country.

The National Forests of the West had been created from the Public Domain, but as the East had no government owned lands, the Weeks Law made it possible for the Federal Government to acquire privately owned lands and administer them as National Forests. What has transpired during the past twenty-five years in developing the National Forest system in the East is vividly portrayed in this article. As the author states, "The beneficial consequences thoroughly justify the Silver Jubilee celebration of the passage of the Weeks Law. They will more fully justify the celebration of a Golden Jubilee in 1961."—EDITOR.

The fact that their first thought was of the creation of a National Park suggests that the people who gathered in Asheville, North Carolina, in 1899, to act constructively to avert what they believed to be a menace to the forests of the Southern Appalachian region, were inspired by esthetic considerations as fully as by those of economic character. To one familiar with the surpassing beauty of the virgin forests of the region, that attitude would be wholly understandable, for in no other part of the United States can be found greater profusion of tree species or richness of foliage, flower and fruits. There may have been at the meeting some concerned primarily with the transmutation of the flowing streams into the electrical energy which was to establish new scales of living and industrial progress, who foresaw that deforested slopes led to eroded soils, which in turn led to silted reservoirs, in turn to capital losses and ruined communities. Possibly some were far-sighted lumbermen who realized the economic weaknesses of then prevailing practices of forest utilization. In

their minds lurked the idea of a future timber shortage which, of course, would mean exploitation of all remaining forests. As they saw it, a crisis was impending that only the Federal Government was capable of meeting in practical and effective ways. Thus was conceived the forest land acquisition program of the United States.

Almost coincidentally, a similar movement was evolving in the New England States. Much of the forest of that region had been cut over and cut again; but by operators more cautious, canny and appreciative of a second crop, less destructive in their logging practices, and enjoying certain natural and popular advantages. Here and there, in remote spots, there still survived majestic white pines on which were discernible the mark of the King's broad arrow; and scores of thousands of acres bore heavy second-growth stands richly productive in growth and value. Nevertheless, the advance of forest exploitation and its increasing destructiveness bred concern and a determination that proper remedial measures should be adopted and applied.

It was logical enough that these two geographically separated movements should fuse; that under the leadership of a New England member of the House of Representatives, John W. Weeks, the supporters of both movements should merge their efforts and jointly draw to their program the support of individuals and groups resident in other sections; that ultimately they should prevail and see the principles they advocated adopted as a national policy and embodied in the law of the land. Exactly that is what actually happened. The Weeks law was signed March 1, 1911, and for a quarter-century it has charted a definite course of public action, unchanged except by amendments which have amplified its provisions and powers.

To vest the new law with constitutionality, provision was made that the lands to be acquired must be situated on the upper watersheds of navigable streams and be found by the United States Geological Survey to be of such character that the maintenance on them of a forest cover would contribute to the navigability of the stream. To safeguard the sovereign rights of the states, the Act also stipulated that no payment could be made for land unless the state in which it was situated, by appropriate action of its legislature, had first expressed its consent to Federal purchase and ownership of such lands. Thus two important political issues were met in ways proved by a quarter-century of practical application to be generally acceptable. No question or adverse decision has arisen on either count.

But the temper of the times was unwilling to vest in a single executive department of the government full and unrestricted power to carry out the Act. As a check and balance, the Act created the National Forest Reservation Commission and stipulated that no land could be purchased without the prior approval of that body. Although other provisions of the Act vested the Secretary of Agriculture with broad powers, the fact that final exercise of such powers legally was impossible without the approval of the Commission created the need for prior determination that proposed courses of action would receive Commission approval, hence the Commission was from its inception a policy-forming as well as ratifying body.

The Commission was an early example of a well balanced coordinating agency. Two of its members represented the Senate; two others the House of Representatives. The legislative branch of the government thus had direct participation in the execution of the program, and through it both state and popular representation was assured. The War Department, which has jurisdiction over all navigable streams, the Department of the Interior as custodian of the public lands, and the Department of Agriculture, then as now conducting all technical forestry activities of the Federal Government, also were represented on the Commission by their executive heads. At the first meeting of the Commission the members elected the Secretary of War as president of the body and that rule has since prevailed. Rumor has it that he was selected as a disinterested arbiter to maintain peace between the rival Departments of Interior and Agriculture, but the fact that the Secretary of War is the ranking Cabinet Officer and was elected President because of his official precedence is the more obvious explanation.

The list of men who have served on the National Forest Reservation Commission since its establishment is replete with illustrious names. The eight Secretaries of War, eight Secretaries of the Interior, seven Secretaries of Agriculture, eight senators, and seven representatives almost all have been men whose names and records will not readily be forgotten. Changing administrations have made the tenure of Cabinet officers shorter than that of the Congressional representatives, which explains their greater number. A charter member of the Commission, Representative Willis C. Hawley, of Oregon, served twenty-two years and knew more of the details of its work than current administrative officers. Another charter member, Representative Gordon Lee, of Georgia, served until shortly before his death, a period of sixteen years. In length of service on the Commission, sixteen years, Senator Keyes, of New Hampshire, surpasses any other member of the Senate. Few members of the Commission have been perfunctory in performing its duties. Its meeting places have been notably deficient in the comfort and convenience characteristic of its members' regular offices, its proceedings sometimes routine and dry to a degree not normally acceptable to executives such as comprise its membership, yet its meetings have been faithfully attended and invariably marked by close attention, keen analysis and constructive criticism.

As defined at one of the earliest meetings of the Commission, the maximum objective and requirement of the Federal program was the acquisition of 5,000,000 acres of lands in the southern Appalachian region and 600,000 acres in the White Mountains of New England. Need for so large a program later came into question, because of the optimistic belief that the owners of related lands would so generally follow the principles of forest management exemplified on the government properties as to obviate the need for extensive Federal purchases. Eventualities failing to support that belief, the trend changed to the enlargement of the New England objective to 1,000,000 acres; to the extension of purchases into northwestern Arkansas so as to knit together the residue of public lands, to which a National Forest status had been given; and to the establishment of a purchase unit in northwestern Penn-

CONFESSIONAL

He who goes into a forest
Under a burden of care,
Trees shall bend softly and lay their
Light hands on his hair,
Shadow and shelter and silence
Solace him there.

Yea, into the forest cathedral
Scarlet with sin though he go,
Trees shall stoop down to forgive him
And bless him, and lo!
He shall go forth into sunlight,
Whiter than snow.

Anne Sutherland

In Uncle Sam's woodlots in the East the course of forest acquisition was charted by the Weeks Law. This document grew out of the fusing of interests in New England and the South, alarmed by the rapid advance of forest exploitation. It has progressed steadily since its enactment in 1911 and expanded to meet the growing national picture. The beautiful shot above was taken of the birch in the White Mountain National Forest in New Hampshire, with Mount Washington in the background. Below—Cold Mountain and the impressive, forest-clad hills in the Pisgah National Forest in North Carolina.

sylvania, on the north fork of the Allegheny, as an element in the flood control program evolved to safeguard Pittsburgh and other Ohio River cities.

At the end of its first decade the program was so well established that the only really serious criticism directed against it was the charge that it was inadequate. It did not touch the critical conditions developing in the Lake States and in the southern pine belt, where the lands requiring constructive management were not upon the upper headwaters of navigable streams, nor subject to the assertion that maintenance thereon of a forest cover favorably influenced the navigability of streams. A select committee to fully investigate the situation, therefore, was appointed by Senate resolution in 1923. Visiting a dozen or more of the larger centers of wood utilization in important forest regions, the committee after exhaustively exploring the field recommended an enlargement of the program to permit Federal purchases of forest lands primarily for the purpose of timber production. While essential that acquired lands should be on the watersheds of navigable streams, they need not be on the upper headwaters of such streams nor necessarily bear a direct relationship to navigability of the streams. Under the sponsorship of Senator Charles L. McNary, of Oregon, and Representative John D. Clarke, of New York, the recommendations of the Senate Select Committee were enacted into law June 7, 1924.

Almost two years elapsed before this wider authority initially was exercised. In 1926 it was applied to the National Forest in Michigan, and the Superior National Forest, in Minnesota, originally comprising lands reserved from the Public Domain and widely interspersed with private holdings. The second year following, what are now the Catahoula and Kisatchie Forests in Louisiana, the Hiawatha and Marquette, in Michigan, and the Wambaw, in South Carolina, came into being. The year 1929 marked even more rapid expansion. In Florida, the purchase program was extended to the existing Public Domain Choctawhatchee and Ocala Forests and the Osceola Unit was created. Purchases were initiated in the Flambeau, Moquah, and Oneida areas, in Wisconsin, the Ottawa, in Michigan, and the Green Mountain Unit, in Vermont. In 1930 there were added to the system of purchase units the Cumberland, in Kentucky, the Evangeline, in Louisiana, the Homochitto, in Mississippi, and the Kiamichi, in Oklahoma. The following year the Mesaba, in Minnesota, and the Vernon, in Louisiana, were established; in 1932 the Chequamegon, Mondeaux and Oconto, in Wisconsin, were placed in an actionable status. At the close of 1932 there existed a total of forty-two approved purchase units in twenty of the states east of the Great Plains. Within them there had been purchased or approved for purchase a total of 4,727,680 acres. In the same areas other lands reserved from the Public Domain, transferred from other executive departments and acquired through exchange aggregated 2,503,875 acres, hence the total area under direct Federal management was 7,231,555 acres.

Thus the situation stood just prior to the advent of the present administration, with circumstances indicating that it might remain that way for an indefinite future period. The appropriation for land acquisition for the fiscal year 1933 was limited to $200,000, possibly sufficient to finance the purchase of 50,000 or 60,000 acres of land. But events in March, April and May of 1933 combined to inaugurate a new era in the history of the Weeks Law.

Limitations of statute and public policy dictated utilization of the labor of the Civilian Conservation Corps largely upon lands in public ownership. But the greater proportion of the enrollees was from the East, by far the greater part of the public lands in the far West. Transportation of the enrollees to the then existing public properties not only would entail heavy travel costs but the states of their origin would be deprived of equitable shares in the benefits of the work. For a sum not much greater than the cost of transporting an enrollee to a western state and back again, there could be purchased in his own or an adjoining state land sufficient to afford him profitable employment for an enrollment period. Both the land and the fruits of the enrollee's work would be permanent assets of the nation and directly contribute to the solution of troublesome problems of land, industrial and social economy. It was sound business management to invest in land what otherwise would have to be expended for costs of travel. Similarly, in relation to employment relief, the greater permanent character and value of work performed on publicly-owned properties afforded a margin sufficient to cover much if not all of the cost of placing the properties in public ownership. The net balance of gain and loss, under the employ- (*Continuing on page* 483)

The silver cascades of Bald River Falls, in the Cherokee National Forest in Tennessee, will sound their note in the Silver Jubilee of the passage of the Weeks Law and forest acquisition in the East.

AFTER THE FLOODS

By

HARLAN H. BARROWS

"THE PREVENTION OF FLOODS IN MOST DRAINAGE AREAS APPEARS TO BE IMPOSSIBLE BY ANY MEANS, FOR MEN CANNOT CONTROL PRECIPITATION."

"IN MOST CASES, THE EFFECTIVE CORRECTION OF FLOOD FLOW IS THE SOUND OBJECTIVE; CONTROL, RATHER THAN PREVENTION, IS THE ATTAINABLE GOAL."

"TO HOLD EITHER DEFORESTATION OR SOIL EROSION PRIMARILY RESPONSIBLE FOR MAJOR FLOODS IS UNWARRANTED IN THE LIGHT OF EXISTING KNOWLEDGE."

"LACK OF WATER, NOT OF SOIL, ULTIMATELY WILL LIMIT THE CAPACITY OF THE COUNTRY AS A WHOLE TO PRODUCE FOOD AND SUPPORT LIFE."

"A COORDINATED, UNIFIED NATIONAL WATER POLICY IS NEEDED, NOT AN UNRELATED FLOOD POLICY, NOT A COLLECTION OF UNRELATED POLICIES APPLICABLE RESPECTIVELY TO INDIVIDUAL TYPES OF PROBLEMS ASSOCIATED WITH THE CONTROL AND USE OF WATER."

THE floods of March in the northeastern states have been followed by spirited discussion of the causes of floods, by contentious argument over the best means of preventing or controlling floods, and by an insistent public demand for protection against floods.

There is agreement as to the conditions which in sequence constitute the proximate causes of floods: First, heavy rainfall, the fast melting of large quantities of snow, or both; second, rapid run-off to stream channels of the large quantities of water thus provided; and third, the inability of the stream channels to accommodate the volume of water coming to them.

Such, of course were the direct causes of the floods of last spring. There is general agreement also concerning the qualitative significance of various conditions contributory to floods. If the ground is frozen or already saturated when rain falls or snow melts, it obviously cannot absorb more water and immediate run-off is at a maximum. If the slopes lack an effective vegetal cover and, particularly, if they also have been cultivated injudiciously, the run-off from them may be much more rapid than it would be otherwise. Conditions such as these appear to have contributed in some areas to the height of the recent floods.

It is one thing to recognize the qualitative significance of certain factors in run-off and therefore in some floods, and a very different thing to generalize concerning their quantitative significance. This is particularly true with respect to the relations of forests and soils to floods. To hold either deforestation or soil erosion primarily responsible for major floods, as certain federal agencies recently have done in apparent recognition of the slogan that "it pays to advertise," is unwarranted in the light of existing knowledge. Such intemperate claims provoke charges of "deception and demagoguery," charges based in part on the definitely recorded fact that high floods occurred in many valleys before the pioneers began to cut down the forests or till the soil.

Inseparably associated with the controversial question of the quantitative effect of deforestation and soil erosion in promoting floods is the question of the efficacy of forests and of measures for the reduction of soil erosion in ameliorating flood conditions. It is to be hoped that the investigations on watersheds by the Department of Agriculture, authorized by the Flood Control Act of 1936, may provide irrefutable answers to these questions. Thus far such investigations in general have been scattered, fragmentary, and inconclusive. Apparently no one knows in detail the effects which the removal of forests or the loss of soil through erosion have had on floods in any drainage area of large size. Not until such knowledge is in hand with respect to several basins, at least, differing one from another in various ways, will it be possible to give proper weight, much or little as the case may be, to measures of forestry and of erosion abatement in planning for flood control in large drainage areas. Until established facts largely replace biased opinion, one may regard as premature the program of the Forest Service, announced July 26, which calls for the public acquisition of a vast area of land in the eastern states, and the rapid restoration of forest cover upon it, as a measure "aimed primarily at flood prevention."

It may well be, as frequently charged of late, that most engineers have had a predilection for costly works for flood control and other purposes on big rivers, and that they have "not given an adequate forum to the problems of up-stream engineering and little waters." Certainly the unprecedented attention which has been given by various agencies to the control and utilization of little streams during the last few years is highly commendable from various points of view. It has helped, for example, to focus attention on a whole train of connected problems that runs from river source to river mouth. It has contributed, however, to the development of mistaken ideas with respect to flood control. An illustration is afforded by the popular idea that systems of small check dams along the little headwaters of a river system are effective agents for the prevention of major floods on the lower and larger numbers of the system. Recognizing this "erroneous conception on the part of the public," a conference on water conservation in Southern California held last year in Los Angeles by prominent engineers, foresters, agriculturalists, and investigators, adopted a resolution which reads in part as follows:

"Check dam systems do not effect the regulation of capital floods and cannot be recommended as flood control measures. They give an impression of false security to the residents of the lower lands."

This does not imply, of course, that check dams have no utility. If properly designed and constructed, they may help to stabilize and consolidate slopes, as the conference indicated, and thus may be important features of erosion control. In countless cases, however, small dams of all types intended to serve diverse purposes have been poorly designed and poorly constructed. Of 4,500 check dams—essentially overflow dams, ranging in height from five feet to fifteen feet—built in Los Angeles county

prior to March, 1935, about half had failed by that date. Numerous other cases might be cited in support of the contention that big floods call for more than little dams. They may, indeed, call for much more than big dams.

Under existing conditions, disastrous floods may occur in any year in any part of the United States. The prevention or effective control of them will necessitate in most critical drainage areas of magnitude the adoption of various remedial measures in suitable combination. Among such measures may be afforestation, reforestation, reduction of soil erosion, control of grazing, construction of detention or storage reservoirs, both large and small, diversion of flood waters to "spreading grounds," erection of levees, provision of floodways, and the clearance or alteration of stream channels. The determination in a given case of the most suitable measure or combination of measures may require both intensive and extensive investigations by skilled technicians in several fields. The prevention of floods in most drainage areas appears to be impossible by any means, for man cannot control precipitation. In many drainage areas prevention of them would be impracticable, even were it possible; the cost would be unwarranted. In some rural areas prevention probably would be undesirable, even if relatively inexpensive and entirely feasible from an engineering standpoint, because of the fertilizing value of the silt-laden flood waters. In general, reduction of flood peaks by retardation or diminution of run-off to stream channels from tributary slopes, in so far as practicable, and control of flood waters along the stream channels in reservoirs, between levees, and the like, where feasible and desirable, must suffice. In most cases, the effective correction of flood flow is the sound objective; control, rather than prevention, is the attainable goal.

The amelioration of flood conditions on a given river system is not in most cases an isolated water problem. It may be related directly or indirectly to drainage, irrigation, waterpower development, navigation, correction of drought conditions, low water control, pollution, municipal water supply, conservation of wildlife, recreational uses of water bodies—to any or possibly all of them. It may be related also, of course, to many aspects of land occupation and land use that do not involve primarily either the use or control of water. Far too often in the past the flood problem has been treated as though it were an isolated problem. Too often it has been treated solely in terms of particular localities, urban or rural, to the avoidable injury of other localities. Too often it has been ignored; highways, factories, towns, even cities have been built directly in the paths habitually followed by recurrent floods, in utter disregard of the fact that man cannot thus flout the laws of nature with impunity.

No integrated plan exists for the effective control and efficient use of the water resources of the country, basin by basin. Moreover, the fundamental data essential to the formulation of such a plan are lacking in greater or less degree on both the surface and underground waters of almost all drainage areas throughout the country. Much remains to be learned, for example, about the relations between rainfall and run-off and about the regimen of streams. Floods on many streams still pass unmeasured for want of gaging stations. Even on important rivers major floods occur time after time without reliable records being made of them. No systematic discharge measurements were made on the lower Mississippi River until after the disastrous deluge of 1927. Without accurate, long-term records of precipitation and streamflow precise studies of probable maximum flows cannot be made, and accordingly, such flood-control works as levees and reservoirs cannot be planned in many cases to best advantage.

During the last fifty years more than sixty large dams have failed when overtopped by floods of unforeseen height. Obviously the best time to provide on an adequate national scale for systematic and continuous records of precipitation and streamflow and for thorough investigations of all the associated physical and cultural problems was before rather than after their importance had been emphasized repeatedly by preventable loss of many lives and much property. Have the latest floods taught the nation the lessons it failed to learn earlier?

The Flood Control Act approved June 22 affords little reason to think that either the public at large, clamorous for protection against a duplication of the recent flood disasters, or the Congress, sensitive to the popular demand, has yet taken a comprehensive view of the water problems that confront the nation. In any case, the act is open to severe criticism on fundamental grounds.

First, it largely ignores the interlocking relationships of the various types of problems associated with the control and use of water, and is devoted almost wholly, as its title implies, to flood-control measures. Instead of making the solution of the problem of floods an integral part of a comprehensive measure for the control and use of water in the various drainage areas—normally the most effective regional units with respect to water problems—the act authorizes merely a reservoir here and a levee there, a retarding dam in one place and a floodway in another, to the number of more than two hundred. It authorizes flood-control projects in areas having other problems of water far more urgent than those of floods and in which multiple-purpose projects, including flood-control, are feasible.

Second, it "represents the first comprehensive effort definitely to establish a Federal policy with respect to flood control throughout the United States." This is, however, a policy conceived in narrow terms. A coordinated, unified national water policy is needed, not an unrelated flood policy nor a collection of unrelated policies applicable respectively to individual types of problems associated with the control and use of water.

Third, it establishes the principle of local participation in the cost of flood-control projects authorized by the Congress, but does so on an inequitable basis. In some cases local agencies would be required to provide, in the form of the lands, easements, and rights-of-way necessary for construction, half the inclusive cost of a given project, while in other cases they would have to contribute less than five per cent of the cost. In general, the cost should be distributed among the beneficiaries in accordance with the distribution of benefits. The benefits of flood protection obviously reach in many cases far beyond the communities chiefly affected; they may, indeed, extend throughout the country. By interfering with the movement of mails, by interrupting the flow of interstate commerce, and by otherwise upsetting the orderly processes of society at large, capital floods on great rivers may inflict serious national losses. In most cases, however, the Federal interest in protection is a relatively minor one, and Federal participation should be determined by, and restricted to, the extent of the national interests involved. These are not susceptible of measurement, of course, but they are subject to reasonable appraisal. The equitable principle of action just stated might be less unpopular in some communities that have suffered from floods or that face a serious flood hazard if the fact were kept firmly in mind that any so-called "grant" or "gift" from the Federal Government must sooner or later be paid back by the people of the country in the form of taxes.

Fourth, certain projects which relate to floods only in minor degree are authorized by the act as flood-control measures, in contravention of (*Continuing on page* 484)

WITH THE TRAIL RIDERS OF 1936

IN THE GREAT SMOKIES

End of a day—on the summit of Mt. Sterling.

NEARLY six hundred miles of wilderness trail—much of it known only to forest rangers, a few hardy ranchers, hunters and scientists— were successfully explored by The American Forestry Association's "Trail Riders of the Wilderness" during 1936.

This remarkable achievement is a real tribute to the idea behind the Trail Rider movement—that the great remaining wilderness areas, the rugged land beyond all roads, have a very definite place in the physical and spiritual welfare of the people of the country, and that it is possible, through competent organization and leadership, to provide a way for their use and enjoyment within the means of the average man, woman, or older child.

The six hundred miles explored by the Trail Riders of 1936 equals, approximately, the total distance covered by all expeditions through 1935, since the movement was inaugurated by The American Forestry Association in 1933. Men and women from nineteen states and the District of Columbia, divided into five separate expeditions, rode into the wildest country remaining in continental United States—one party into the great Flathead-Sun River Wilderness, of Montana, another into the high Bridger Primitive Area of the Wind River Mountains, in Wyoming, still another into the mysterious and canyon-studded Gila Wilderness, of New Mexico, and a fourth into the beautiful and little known Olympic Wilderness, in the State of Washington. The fifth party explored the roadless, hidden wilderness that is the true grandeur of the Great Smoky Mountains, in North Carolina and Tennessee.

The Wildernesses of the Olympic and the Great Smoky Mountains were explored by the Trail Riders for the first time in 1936; in the Wind River and the Gila Wildernesses, expeditions were first made in 1935. There have been expeditions into the vast Flathead-Sun River Wilderness every year since 1933.

The story of the Trail Riders of 1936 can perhaps be told with greater vividness in pictures. The true beauty and drama of the great back country of America defies description, even in the hands of the most skilled craftsmen. Consequently, the following four pages are devoted to a graphic pictorial recital of the land "at the back of beyond"—the land which few, with the exception of the Trail Riders themselves, have known under the spell of sunrise and sunset, of moonlit and starlit nights, of quiet and solitude, of Nature unchanged by man.

On Page 482 will be found the names of those who rode with the Trail Riders of the Wilderness in 1936.

It is not all riding with the Trail Riders in the Great Smokies—a try for the "big fellows" in Raven's Fork Creek. Left, the party on the summit of Mt. LeConte.

IN THE HIGH OLYMPICS

As the rugged, broken mass of peaks of the Olympic Mountains, in the State of Washington, rising in majestic beauty over a hinterland of glacier mountains and virgin forests, appeared to the Trail Riders from Hayden Pass, 6,000 feet above sea level. The Riders, numbering twenty-three, formed the largest group ever to ride these wild trails of grandeur.

At right, one of the Riders at beautiful Lake LaCrosse, in the heart of the Olympics, 5,100 feet above the salt water that surrounds the Wilderness on three sides.

At left, the rare beauty of the Olympics at sunset — Lake Margaret as the Trail Riders found it at the end of the ninth day.

Below, the first party of Trail Riders to explore the wild Olympics — the entire group, including guides, packers and wranglers, at Low Divide Chalet.

At left, a pause along the Seattle Creek Trail near the end of the journey. Of the 4,000,000 acres comprising the great Olympic Peninsula, 1,500,000 acres are included in the Olympic National Forest. The higher and more dramatic peaks make up the Mount Olympus National Monument.

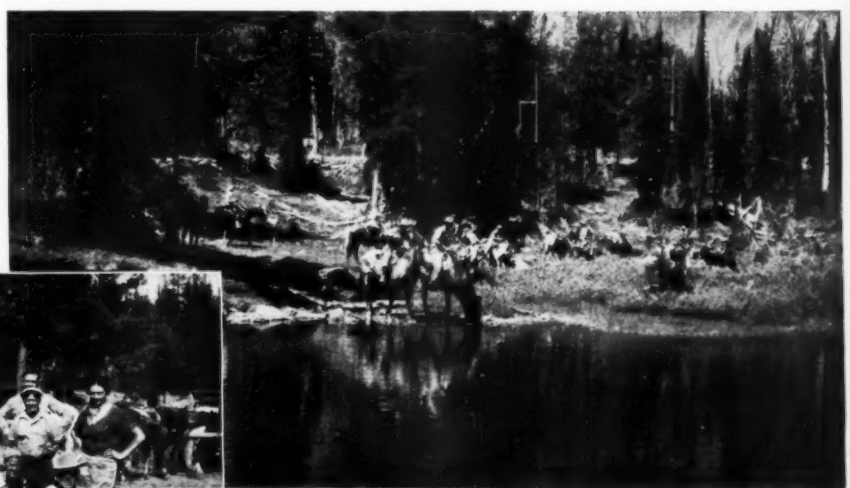
MONTANA'S RUGGED WILDERNESS

The objective of the Flathead-Sun River Expedition of the Trail Riders of the Wilderness—the "Chinese Wall," winding for more than fifteen miles along the Continental Divide.

Above, the wall is viewed from the Sun River country of the Lewis and Clark National Forest; beyond is the wild region of the Flathead National Forest, both in Montana. In the foreground is the beautiful bear grass, so well known to the Trail Riders.

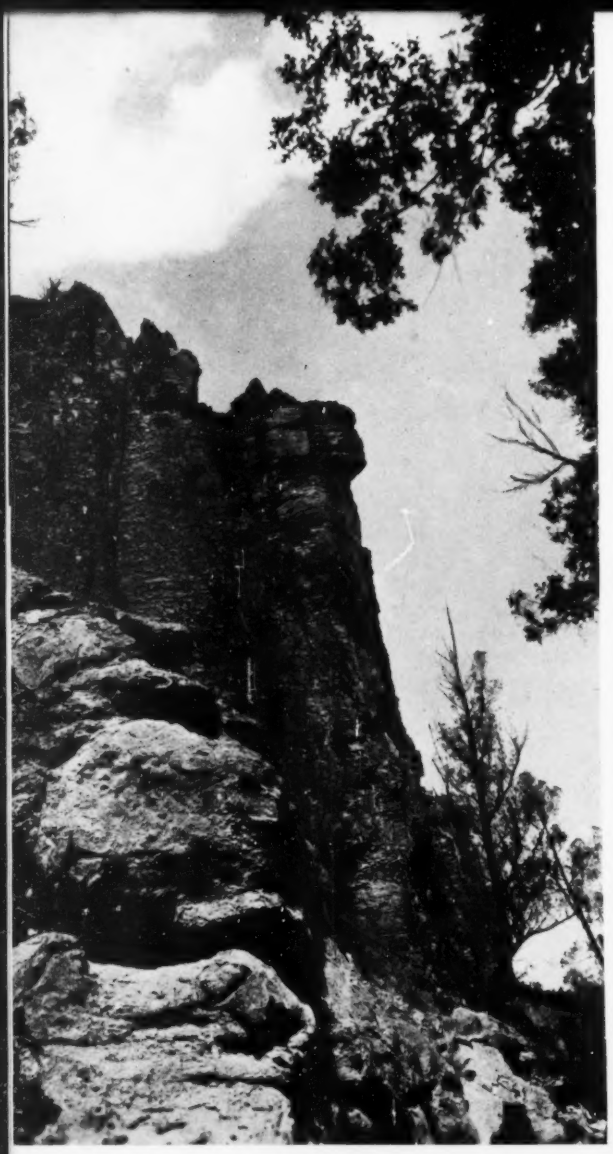
On the way to the country "at the back of beyond," as the Flathead-Sun River Wilderness is known. It was here that the Blackfeet Indians held their picturesque ceremonial sun dances; it was in this country also that the first expedition of the Trail Riders was made in 1933. It is a country of lofty mountains, dramatic in their boldness; it is a land where bear, deer, elk and mountain goat live practically undisturbed by man. It contains more than 1,000,000 acres of rugged primitive country. Five expeditions of Trail Riders have entered its fastness — but there are trails, many miles of wilderness trail, yet to be explored.

Water is one of the enchantments of the back country of Montana. In addition to the Flathead and Sun Rivers, and their clear, swift tributaries, the Riders of 1936 explored and fished Big Salmon Lake, perhaps one of the most beautiful lakes cradled between forested slopes, Holland Lake, Lindbergh Lake and others.

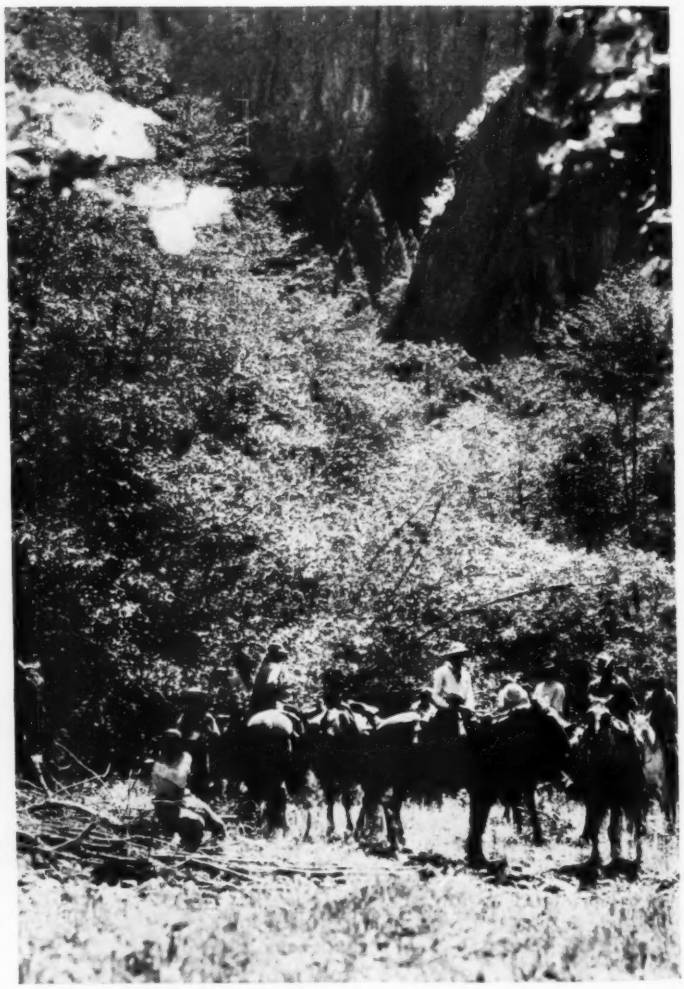


Above, the Montana Trail Riders of 1936 and, at right, on the way to the Continental Divide in the Northern Rockies, through basins formed by ancient glaciers.

NEW MEXICO'S TRAILS OF ANTIQUITY AND ROMANCE



The glory of the great Gila Wilderness, in the Gila National Forest, in New Mexico, is in its hidden, winding canyons, buttes and mountains that reflect astonishing colors in the sun. Above is part of the red and white wall of Little Bear Canyon which leads into the greater Canyon of the Middle Fork of the Gila River, which the Trail Riders explored in 1936.



A pause in the Middle Fork Canyon to photograph its colorful beauty. The great walls here were nearly 1,500 feet high—straight up.

Below, the Gila Trail Riders just before their descent into the mysterious Middle Fork Canyon.

WILDERNESS TRAILS IN WYOMING

The gateway to the Bridger Primitive Area, in the Wind River Mountains of the Wyoming National Forest, in Wyoming—Upper Green River Lake and Old Square Top. Here the Trail Riders set out for twelve days of adventure in what is perhaps the most dramatic wilderness remaining in continental United States.

Early morning, with the jingle of horse bells in the air. Breaking camp at New Fork Park, with the morning mist still on the mountains. From this picturesque camp the Riders headed into a land of glaciers, perpetual snow valleys and nameless lakes—the crest of the Wind River Mountains, which seldom drops below 10,000 feet in elevation.

Going up—near Island Lake, 10,500 feet above the sea. This is th country that remains a citadel of ice and rock, of timberline trees—muc the same as when it was so closely associated with such picturesque figur as Fremont, Bonneville and Jim Bridger.

▼▼▼

At right, the Wyoming Trail Riders at Crow's Nest — rededicating the Trail Rider Monument, shown at extreme left, erected by the pioneer expedition in 1935.

A telescopic view of the bluff and the raven's nest, as seen from just across the creek that runs near the base of the bluff. It was this picture that aroused Brockway's interest in the wilderness section along Roarin' Fork Creek, and which caused him to make the eventful, and nearly fatal, trip.

RAVEN'S NEST

A TRUE STORY OF REAL ADVENTURE IN THE GREAT SMOKIES

By

CARLOS C. CAMPBELL

Photographs by Thompson, Inc.

BROCKWAY CROUCH is a bird lover. When his friends returned from a trip in the Great Smoky Mountains he paid little attention to their enthusiastic reports of the scenery they had found along the untrailed Roarin' Fork Creek. He had explored wilderness sections of the Great Smokies himself.

"But these are different views," his friends explained. "And you don't know anything about a wilderness until you've seen Roarin' Fork. Huggins' Hell isn't a circumstance!"

Huggins' Hell, on the other side of Mt. LeConte, was considered the most rugged area anywhere in the Great Smokies. According to legend, it was named for a Mr. Huggins, who boasted that he would conquer that unknown wilderness or go to that hottest of all places. He entered it, all right, but never returned.

The comparison of Roarin' Fork with Huggins' Hell aroused some curiosity in Brockway. And as he heard more about the ten or twelve spectacular waterfalls and their nearby bluffs he began to see possibilities that his friends, who were only hikers, had not seen. What a haven, he thought, for the golden eagle or northern raven!

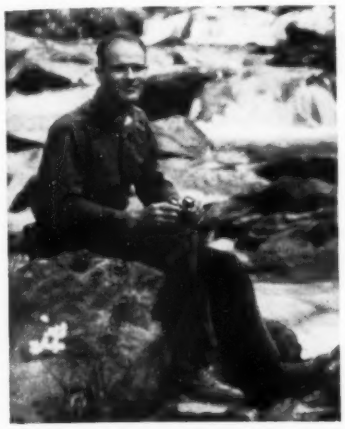
There were other cliffs and ridges in the Great Smokies almost as rough, but they were not so completely hidden from the routes usually followed by the increasing thousands of hikers, nature lovers and botanists. The turbulent, hectically plunging stream described by his friends was too much for tenderfeet, he reckoned. And Brockway knew from study and personal observation that such regal birds as the golden eagle and the raven did not like people—tenderfeet or otherwise.

He said little, but thought much. This was just the kind of place they would most likely build their nests, he reasoned. And the nesting place of either had not yet been discovered.

Hunting the nest of an eagle or a raven was not a task to be undertaken by a crowd, not if these highly prized birds were to remain undisturbed. He asked more questions, studied the pictures that had been made on the exploring trip through that deep-cut gorge, all the time trying to conceal his intense interest. Suddenly a big, pyramidal crevice up the face of a bluff caught his eye. A magnifying glass was brought into use. By careful questioning he sought its location. How could it best be reached?

Maybe "best" is not the correct word. Those of us who had been there felt that there was no "best" way. He learned, however, that the least difficult approach was from downstream. It was an extremely hard half-day's work coming down from the top of Mt. LeConte to this bluff—and, of course, one had first to get to the top of Mt. LeConte. That was another stiff climb, even along the trail. Only three or four falls had to be skirted in going in from below; eight or ten from above. Of course, one had to force his way through the jungle of gnarled

rhododendron and laurel to get around the falls, and there was no indication which would be the less difficult—or the possible—way around. But, if the wrong way should first be attempted, one could still try the other side. At least, that is the method we had used. For more than two miles it was a matter of choosing between a struggle through the maze of undergrowth or hopping the boulders of the stream.



Brockway Crouch—bird lover, who made the near-fatal plunge of fifty feet in the Great Smoky Mountains National Park.

Nothing more was said about the picturesque Roarin' Fork for quite a while. It seemed that Brockway had lost interest in the place. But early one morning we received a shocking call from the hospital. Brockway was badly hurt, they reported, but they thought he would live!

With a single companion, W. W. Stanley, he had started from Knoxville early on the previous morning. It was late spring, so that the young birds would be hatched and gone, and thus not disturbed. It had taken all morning and a part of the afternoon to find the particular bluff. Considerable reconnoitering had been done to find the best way to reach the opening where the nest was expected, or to see if it really could be reached.

The bluff rose perpendicularly for a hundred feet. The possible nest-crevice was halfway up. Above this, there was a bulge outward, which provided shelter and other protection from above. Below there were few crevices or other irregularities that could provide footing for climbing.

Brockway had hiked hundreds of miles in the Great Smokies, but he could hardly be classed as an Alpine climber. Nevertheless, he did want to see what bird had built a nest in that likely-looking crevice. A fireman's ladder would be just the thing, but such conveniences were out of the question. If he was to see inside that crevice he must get to it under his own power.

He started, slowly, up the side of the bluff. As he reached points where he could go no farther, he worked over to one side or the other and tried a new route. Perilously he crept along, back-tracking now and then. Finally, it appeared that he would succeed. But there was a slight over-hang just below the opening and, try as he did, he could not make the last few feet. His companion, a smaller, but equally agile man, was likewise stopped.

A new angle of approach was decided upon. They went around to the top of the cliff and anchored a rope to a big laurel bush. This would make a good picture, and Stanley went below with the camera to photograph Brockway as he examined the nest. The rope was doubled, with a loop at the bottom and Brockway, putting one foot between the strands and wrapping the other leg around, lowered himself slowly and carefully.

Upon reaching the bottom of the rope loop, he was on a level with the intriguing crevice, and saw unmistakable evidence that it was the rare northern raven which had nested there. The overhead bulge made it impossible for him to reach the nest, however, so he swung the rope gently back and forth until his feet rested on an outcropping rock.

Eagerly he reached out for a few particles of the nest material. But as he did so, and before he could realize what was happening, the rock (*Continuing on page* 485)

Four such waterfalls punctuate the turbulent Roarin' Fork Creek below the raven's nest bluff. There are eight falls and cascades between the bluff and the top of Mt. LeConte. Great skill and knowledge of woodsmanship are required to get safely around these spectacular falls.

HERDS IN SAN SIMON VALLEY

What Has Happened to the Promised Land of Arizona's Oldtime Cattlemen

By WILL C. BARNES

SOMETIME along in the early fall of 1882, I set forth from Fort Apache, in Arizona, seeking a suitable location for a modest bunch of cattle. There was plenty of unoccupied range then in the Southwest, but being enthusiastic about the cattle business, I wanted nothing but the best, a "top notcher".

An old Army officer who had chased Apaches from one end of Arizona to the other, advised me to look over the San Simon Valley, on the east side of the Graham Mountains. I had heard of the Valley from stories related to me, even when it was known as *Valle de Sauz*, meaning "Willow Valley", because of the willow thickets along the upper reaches. So I set out in that direction, full of hope.

A ten-day cruise over San Simon proved the old Army officer was an excellent judge of a stock range. My only disappointment was that the willows were gone. The Valley was found to be practically unoccupied, a well watered, well grassed area about sixty miles long and forty miles wide, including the long mountain slopes on each side. It contained, I reckoned, about 750,000 acres of grazing land.

San Simon joined the wide valley of the Gila River near where a store had been established as early as 1872, and around which settlers had located their homes for safety from the Apaches. Their farms were irrigated by means of small brush and rock dams which turned the Gila waters onto their fields. The place eventually became Solomonville, a thriving little farming settlement.

The stream in the San Simon Valley was an intermittent affair, flowing quietly over the gravelly bottom for a mile or two before becoming lost in the sand only to reappear again farther along. Here and there along the stream great "water holes" had been scoured out by the current. This guaranteed stock water when the streamflow fell away in the dry season.

On its lower course were many beautiful grassy meadows, spangled with wild flowers of every hue. Great cottonwood trees—the pioneers' best friend—and willow thickets lined its banks. In the widespread branches of the cottonwoods yellow and orange blackbirds, goldfinches and other birds of brilliant plumage made colorful pictures. Farther back, and extending clear to the foot of the mountains, mesquite, ironwood, palo verde and other desert trees were plentiful.

The meadows were covered with soft lush grasses, almost untouched by animals except for the horses and mules of an occasional traveler and the deer and antelope that came to the stream for a drink. Everywhere on the more open areas those fine stock grasses, black, blue and hairy gramas, grew luxuriantly. Here and there along the wash were tracts of alkali land on which sacaton touched my stirrups. A little farther back large areas were covered with another useful forage plant, known to the Mexicans as *galleta*, botanically *hilaria*, one of the earliest to "green up" in the spring.

San Simon Valley in 1882 was a well watered, well grassed area about sixty miles long and forty miles wide, including the long mountain slopes on each side. It was practically unoccupied and contained about 750,000 acres of grazing land.

There were then practically no banks to this stream. It simply flowed softly and quietly on top of the ground, except at its lower end where it entered the Gila, a much larger and deeper stream. As I remember it, the banks of the San Simon at the junction were then not over three feet high and the wash itself measured not over twenty feet from bank to bank.

Running back to the foothills on each side the grama grasses covered the whole range

But in fifteen years Southern Arizona was discovered by the great herds of longhorns from west Texas —and under the old "open range" conditions, the Valley was devastated, and the hungry Gila River swept down and carried away 20,000 acres of what had once been fine grazing land.

with their rich growth, while several sages, especially one called *estafietta* by the Mexicans, grew in dense bodies, furnishing splendid forage in winter when the range was covered by snow, or in dry seasons when grass was short.

To an embryo stockman this San Simon Valley was indeed a promised land.

The old-timer with me summed it all up when he said: "What more do you want? Here's grass of every kind, some for good seasons an' some for dry ones. There's plenty of sage an' other browse for winter an' trees full of mesquite beans for the hungry old cows every fall. There's water, but not too much of it, which is a good thing for any range."

He told me how the old cows would get down on their knees and crawl under the low overhanging mesquite branches and lick up the long white mesquite beans lying thick on the ground. In later years when feed was scarce, many an old range cow got fat as a seal on these beans.

Here, in San Simon Valley, was the new grazing range I was seeking. Along with two other cattlemen, I picked out a special tract to which I meant to return and claim for my very own. But alas for the plans of men. Shortly after I left the Valley, Apaches from the San Carlos Reservation, sixty miles to the west, swept up the Gila Valley leaving behind them a series of burned ranches and murdered settlers.

This was something for which I had no desire. Life even in those days was sweet. The Gila River was the Indians' main highway from the Apache Reservation down to Old Mexico, so I decided I did not crave a ranch in their vicinity. I sought farther for a new location.

It was about fifteen years after this first visit that I returned to San Simon Valley. In the meantime, southern Arizona had been discovered by west Texas ranchers, crowded from their own State through the leasing of the State-owned lands to more far-sighted stockmen. The trail across southern New Mexico to Arizona was all cluttered up with herds of longhorns, slowly but steadily grazing their way west. Under the old "open range" conditions, these great herds of cattle were devastating the San Simon Valley. It was a mad race to get the grass first. No one was there to say them nay; no one seemed to care what the results of this overgrazing and overstocking (*Continuing on page* 481)

Ruined by uncontrolled, unrestricted grazing and consequent erosion—green meadows replaced by drifting sand—a system of check dams has been built to stop erosion and try and save the land.

EDITORIAL

Forest Protection—Past and Future

THE accomplishment of twenty-five years of federal, state and private cooperation to extend protection to some 420,000,000 acres of private and state owned timber may well be reviewed at this time and immediate goals should be established for the future.

With the passage of the Weeks Act on March 1, 1911, only sixteen states had appropriated money to engage in the protection of forests from fire. The immediate effect was to make the administration of fire protection a recognized field of activity for state forestry departments, and shortly after the passage of the act eleven entered into cooperation with the Federal Government. The relatively small initial federal allotment of $36,692 was augmented with $220,565 from state and private sources to place more than 60,000,000 acres of the more valuable and more easily accessible forest lands under protection.

The Act had established the principle that public values and public interests justify the public in bearing a part, or all of the cost of protecting forest properties in private ownership against damage by fire. During the ensuing years other states have accepted the opportunity for cooperation, and Congress, having recognized federal responsibility, not only made increasing annual appropriations, but in 1924 broadened the basis of cooperation by the passage of the Clarke-McNary Act. Today thirty-nine of the forty-two states legally authorized to carry on forestry activities are receiving allotments under the Act. Nearly 240,000,000 acres of forest land are under protection, and the states and private timberland owners are appropriating nearly $5,000,000 with which to match a federal appropriation of $1,655,000.

With average annual expenditures of less than three cents an acre, last year's fires burned only a little over one per cent of the protected area, and destroyed about $8,000,000 in timber values. In contrast to this, fires on the smaller and less valuable area of unprotected forest land destroyed more than $37,000,000 in timber values. Here is an outstanding example of the opportunity to spend money to save money. Its significance is emphasized when one realizes that the appropriations under the Clarke-McNary Act represent less than one per cent of all federal aid appropriations to the states, such as those for highways, the National Guard, vocational education, and the agricultural extension service.

With these accomplishments in mind, the goal for appropriations for the fiscal year beginning July 1, 1937, should not be difficult to determine. For the present Federal participation is limited in the Clarke-McNary Act to $2,500,000. State Foresters and cooperating timberland owners are prepared to support The American Forestry Association in requesting the Bureau of the Budget to include this amount in the estimate. It is hoped that the request will be further supported by the President and by the Secretary of Agriculture. Even then, however, it must be carried through Congressional committees and acted upon by the House and Senate at the coming session of Congress.

Action by Congress is the result of public interest. The goal will be reached only when the public realizes the extent to which forest protection results in public benefits in the form of improved streamflow protection, opportunities for recreation, and in economic and social returns that come from growing timber. They must realize, too, that most of the fires are caused by the public rather than by the owners, and that public agencies alone are able to cope with the situation.

These facts will soon be considered by the Bureau of the Budget during official and public hearings, and will be clarified in greater detail during public hearings before the Congressional committees. The process is sometimes trying and always expensive, but some such course is necessary if organized forest protection is to keep pace with the accomplishments of the past twenty-five years.

Flood Control Featured By Conference

The American and Pennsylvania Forestry Associations Join in Significant Meeting

DEVOTED to the most vital forestry problems of the day, the 61st annual meeting of The American Forestry Association, held at Eagles Mere, Pennsylvania, September 9, 10, and 11, jointly with The Pennsylvania Forestry Association, celebrating its 50th Anniversary, by unanimous vote urged President Roosevelt to include forest land purchases by public agencies, reforestation on both public and private lands, together with soil erosion prevention and forest management, in the flood control program of the Federal Government.

It further recommended that funds for such forest land purchases, reforestation, soil erosion control work, public forest organization, establishment and permanent administration be allotted by the President.

In making these recommendations the conference affirmed its belief in the importance of proper establishment, protection and management of forest and other vegetation on watersheds, and asked that immediate steps be taken to put into practice such measures as are already known to be helpful in retarding the rate of run-off of water and increasing the capacity of watersheds to absorb and retain moisture. It further urged the compilation and synthesis by the National Resources Committee through the United States Forest Service, the United States Soil Conservation Service, Federal agencies involved, of all existing and all other or readily obtainable data on the relation of vegetation to streamflow.

FREDERIC C. WALCOTT
Toastmaster, who spoke for wildlife.

The conference also endorsed the Civilian Conservation Corps program and urged upon the President and Congress that it be continued.

It urged the establishment of a civil service for all conservation agencies throughout the country, in order that the continuous services of trained, experienced employees may be assured.

The need of a more intensive educational program in all phases of conservation was recognized by the conference and a program enlisting the active interest of states, counties, communities and individuals was urged. In this direction it was recommended that the teaching of conservation in the public schools be immediately considered by state educational agencies. The conference expressed its unanimous belief that primitive forest areas should be preserved and that where necessary gates or barriers on existing forest roads into wilderness areas be placed to restrict their use to admistrative purposes only.

With sessions devoted principally to flood control and forest recreation, termed by the speakers as "modern forestry," the conference heard such national authorities as Harlan H. Barrows, professor of Geography, University of Chicago, and a member of the Water Resources Committee of the National Resources Committee; William B. Rodgers, president of the United States Flood Control Federation; Frederic C. Walcott, former United States Senator from Connecticut, now president of the American Wildlife Institute; Charles H. Taylor, assistant director, Emergency Conservation Work, and others.

Addressing a special flood control meeting at Williamsport, one of the Pennsylvania cities suffering heavily from floods this spring, Mr. Barrows said: "To hold either deforestation or soil erosion primarily responsible for major floods is unwarranted in the light of existing knowledge. No one knows in detail the effects which the removal of forests or the loss of soil through erosion have had on floods in any drainage area of large size. Not until such knowledge is in hand with respect to several basins, at least, differing one from an-

PHILIP W. AYRES
Director, The American Forestry Association.

H. GLEASON MATTOON
President, The Pennsylvania Forestry Association.

AT LAKE GANOGA

Where the conference was addressed by William Ricketts and Francis R. Cope, Jr. amid beautiful surroundings.

other in various ways, will it be possible to give proper weight, much or little as the case may be, to measures of forestry and of erosion abatement in planning for flood control in large drainage areas."

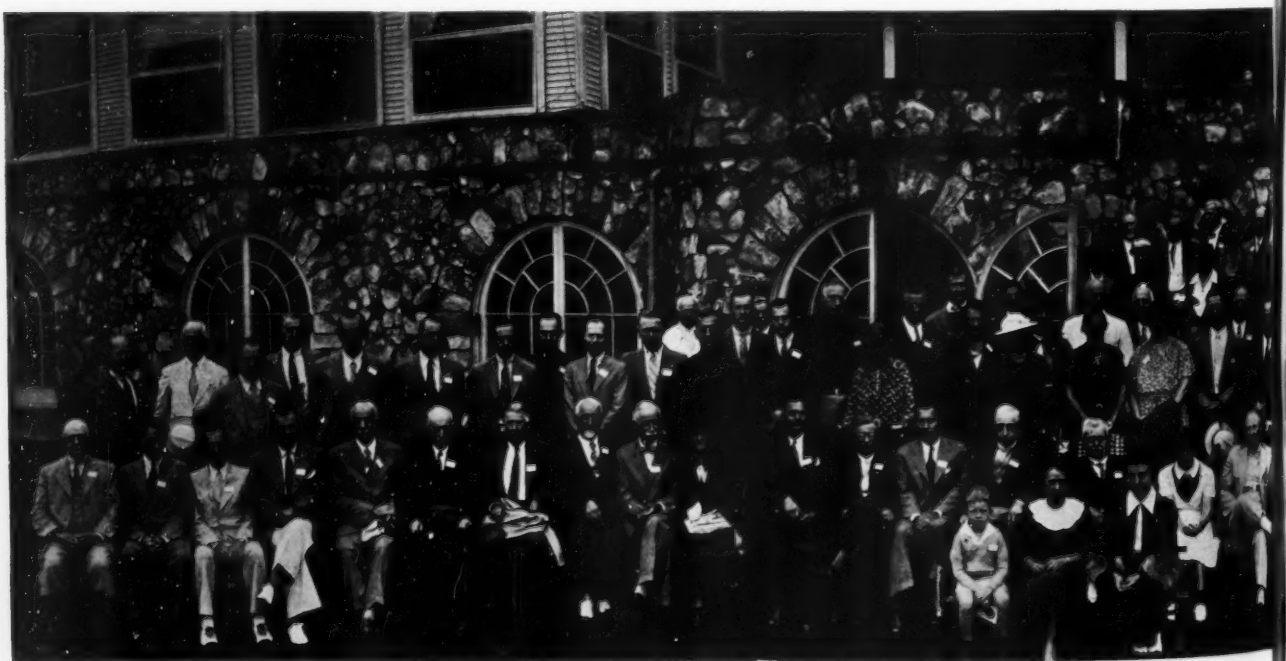
Until established facts largely replace biased opinion, he stated, one may regard as premature the program of the United States Forest Service, announced July 26, which calls for the public acquisition of a vast area of land in the eastern states and the rapid restoration of forest cover upon it, as a measure "aimed primarily at flood prevention."

"Under existing conditions," Mr. Barrows said, "disastrous floods may occur in any year in any part of the United States. The prevention or effective control of them will necessitate in most critical drainage areas of magnitude the adoption of various remedial measures in suitable combination."

He said that among these measures may be afforestation, reforestation, reduction of soil erosion, control of grazing, construction of detention or storage reservoirs, both large and small, diversion of flood waters to "spreading grounds," erection of levees, provision of floodways, and the clearance or alteration of stream channels.

"The prevention of floods in most drainage areas appears to be impossible by any means, for man cannot control precipitation. In many drainage areas prevention of them would be impracticable, even were it possible; the cost would be unwarranted. In some rural areas prevention probably would be undesirable, even if relatively inexpensive and entirely feasible from an engineering standpoint, because of the fertilizing value of the silt-laden flood waters. In general, reduction of flood peaks by retardation or dimunition of run-off to stream channels from tributary slopes, in so far as practicable, and control of flood waters along the stream channels in reservoirs, between levees, and the like, where feasible and desirable, must suffice. In most cases, the effective correction of flood flow is the sound objective; control, rather than prevention, is the attainable goal."

The Flood Control Act of June 22, Mr. Barrows believes, largely ignores the interlocking relationship of the various types of problems associated with the control and use of water, and is devoted almost wholly to flood-control measures. A coordinated, unified national water policy is needed, he said, not an unrelated flood policy nor a collection of unrelated policies applicable respectively to individual types of problems associated with the control and use of water. Another objection he had to the Act was that it establishes the principle of local participation in



Part of the great gathering at picturesque Eagles Mere celebrating fifty years of forestry

the cost of flood-control projects authorized by Congress, but does so on an inequitable basis. Certain projects, he said, which relate to floods only in minor degree are authorized by the Act as flood-control measures, in contravention of existing national policies with respect to the major interests involved.

"The national drainage basin study which the Water Resources Committee of the National Resources Committee now has under way," he said, "has three major objectives: First, is to indicate the outstanding water problems in the various drainage areas of the country; second, is to outline broadly an integrated pattern of water development and control; and third, is to present specific construction projects and investigations projects as elements of the integrated plan, with priorities of time and importance." (Mr. Barrow's address in full is presented on Page 447 of this issue.)

William B. Rodgers, on the same program with Mr. Barrows, envisioned many shortcomings in the Flood Control Act, but expressed his belief that it represented the groundwork for a comprehensive flood control program. "This Act accomplished two very important results," he said. "First, it embodied into the national law the principle that flood control, as distinct from navigation, comes within the scope of Federal interest, and second, it gives definite authorization to the Ohio River Basin flood control program that had previously been recommended by the United States Army."

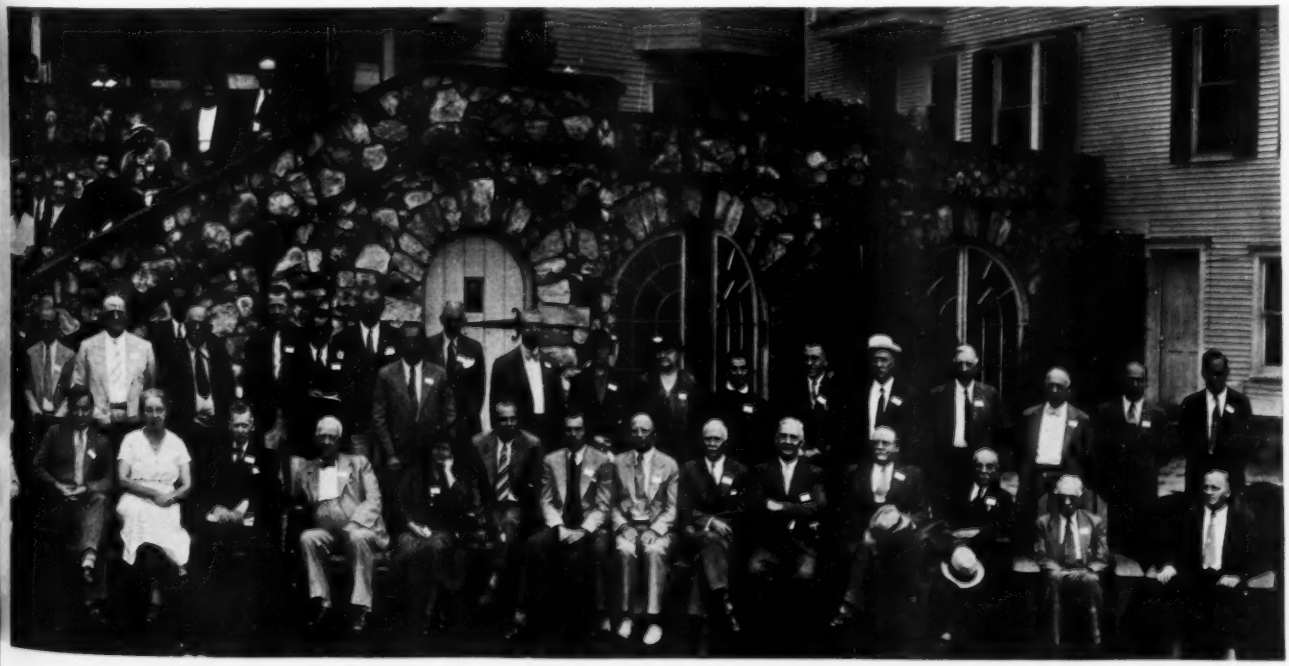
He recommended an intensive nationwide campaign of education not only to acquaint the people of the country with what is being done in flood control, but to gain national support for needed and important future legislation

IN RICKETTS GLEN

Along famous Kitchen Creek, one of the outstanding recreational areas in the State of Pennsylvania.

on the subject. In the field of forest recreation the conference not only viewed and studied some of the most important recreational developments in the State of Pennsylvania, including World's End, now a state park, and Ricketts Glen, in famous Kitchen Creek, which the State is now attempting to acquire for state park purposes, but was addressed on the subject by outstanding authorities.

At the American Forestry Banquet, dedicated to the subject of forest recreation, former United States Senator Frederic C. Walcott, serving as toastmaster, told of the place wildlife has in the recreation problem. He pictured it as basic to any program dealing with land use for recreational purposes—or practically any other purpose. He also defended the work of the Civilian Conservation Corps in wildlife and recreational developments, saying that while mistakes have been made in some instances, the program as a whole is worthy of the trust the President



in Pennsylvania and the sixty-first anniversary of The American Forestry Association.

W. B. RODGERS

Pennsylvania State Senator and President, United States Flood Control Federation.

placed in it. He further explained the workings of the new Wildlife Federation and the American Wildlife Institute, of which he is president, placing the aim of the latter as "developing much needed research in the field of wildlife protection and restoration."

J. F. Bogardus, secretary of the Pennsylvania Department of Forests and Waters, gave the conference a vivid picture of the natural areas in Pennsylvania. From the standpoint of recreation, he endorsed the program of both the Federal Government and the State of Pennsylvania in purchasing the few remaining areas of virgin timber in the State in order, he said, that "these may be used for study and for the enjoyment of the people."

Speaking for Robert Fechner, director of Emergency Conservation Work, Charles H. Taylor, assistant director, told of the accomplishments in forest and park recreation of the Civilian Conservation Corps.

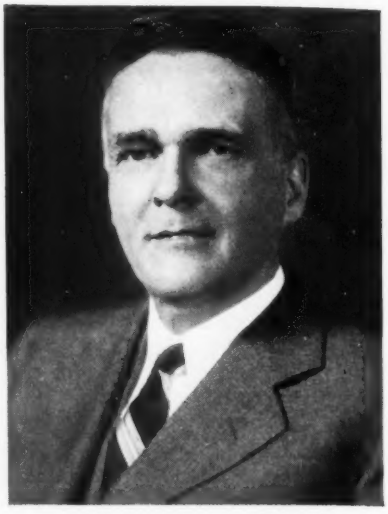
"Thousands of public camp grounds and recreational spots have been selected and prepared with their accompanying facilities," he said. "The cleaning of streams, and the rearing of fish to restock those streams, has lately become an important C.C.C. activity, and I wonder if any one can evaluate the public reaction brought about by knowledge of the forests gained through the use of the recreational facilities made possible through the Civilian Conservation Corps?"

J. F. BOGARDUS

Secretary, Pennsylvania Department of Forests and Waters.

The Corps' record of work, he said, shows that much has been done throughout the nation to develop and expand recreational facilities in forests and parks. "In the last three years the men of the C.C.C. have increased the recreational usefulness of National Parks and have made great progress in developing new state park areas for recreational use. Largely as a result of the stimulation given state park development through the C.C.C., our state park acreages have been increased by approximately 600,000 acres.

"Recreational opportunities and facilities for the public in National and State Forests have been greatly increased," he pointed out. "The Forest Service has developed more than 3,000 camp grounds in the National Forests, the majority of which were developed by the Civilian Conservation Corps."



HARLAN H. BARROWS

Of Chicago, Member, Water Resources Committee of National Resources Committee.

When all the C.C.C. recreational accomplishments are translated into terms of human welfare and human happiness, he said, they mean that "millions of our citizens who, heretofore, were unable to enjoy the physical, mental, or spiritual benefits of the outdoors, are now able to do so."

Francis R. Cope, Jr., one of Pennsylvania's leading conservationists, emphasized the need for a coordinated plan of management for state forests in which recreation is given its increasingly proper place.

George H. Wirt, chief forest fire warden of Pennsylvania, presented a brief history of the Pennsylvania Forestry Association which established the forestry movement in Pennsylvania fifty years ago. The conference was the Golden Anniversary Celebration of the Pennsylvania association.

Professor A. A. Allen, of Cornell University, exhibited his remarkable sound motion pictures of vanishing American birds. It was one of the highlights of the meeting.

The conference was called to order by H. Gleason Mattoon, president of The Pennsylvania Forestry Association. The problems to be dealt with were presented by Philip W. Ayres, a director of The American Forestry Association, acting for Henry S. Graves, president of the Association, who is in Europe.

GEORGE H. WIRT

Chief Forest Fire Warden of the State of Pennsylvania.

MUST THEY STARVE?

By BEN EAST

With photographs by the Author

The trail's end—a fawn's sorry finish.

WE sat, five of us, in Holger Johnson's snug cabin on Chippewa Harbor, on the south shore of Isle Royale, one rainy night in late April, 1935, and talked about Michigan's great deer herd and the likelihood that starvation would strike down hundreds of the animals within a year.

The Michigan Conservation Department had just had an impressive object lesson in the winter starvation of big game animals. We were on Isle Royale to take back to the mainland of the Upper Peninsula eleven moose live-trapped during the winter, as an experimental step to learn what could be done to relieve the hunger toll among the moose of the Island.

A year earlier winter starvation had struck the overcrowded moose herd with the swiftness and certainty of a lightning bolt, leaving dead moose by the hundreds on the ridges and in the swamps of Isle Royale when the snow melted. The Conservation Department had tried the live-trapping in a small way, in the hope of finding at least a limited remedy for the sorry conditions.

This last winter, incidentally, more than fifty moose were trapped in a more ambitious project, and of that number thirty-eight were transported safely to the mainland, to be released in three areas where it is hoped they will establish themselves as resident game animals. But in spite of this relief effort hunger again riddled the dwindling ranks of the Island herd and the future of the remaining moose is still black.

But that is another story.

With the object lesson of the moose before us — and with the memory of half a dozen gaunt carcasses we had seen that day fresh in our minds—it was natural our talk that night should turn to the threat of wide-scale starvation in Michigan's winter deer yarding areas.

"I can take you to Johnswood Swamp on Drummond Island a year from now," Harry D. Ruhl, chief of the Game Division of the Conservation Department declared, "in an area of only four thousand acres, that has seen a heavy concentration of hunters for many years and has never known a closed season, and show you proof that hundreds of deer have died of winter hunger and the complications that follow it."

Early this past May I went with Ruhl and a party of State game men into the Johnswood Swamp, and he made good his sorry prophecy. It was not a pretty picture the swamp had to unfold, of what had taken place there while the winter snows were heaped to a depth of many feet.

What the melting snows left behind—seven dead deer found on less than forty acres of swamp land.

In two days of searching our party covered, as nearly as could be estimated, a little less than three hundred acres of the deer yard. This calculation was based on the number of miles each man traveled afoot and the average number of yards he could see

Deer hunting is an industry in Michigan—the State licensing nearly 100,000 deer hunters annually.

into the timber on either side and spot dead deer. This latter figure was worked out carefully by recording the distance at which each carcass was first seen.

On the acreage covered thirty-four dead deer were found, all fawns of the previous spring that had perished of hunger when older animals stripped away the last dwindling remnants of winter browse within their reach.

The average was about one dead deer to each eight acres of the swamp. Care had been used to select typical areas of the yard, some along the Lake Huron beach, some inland. On the basis of that evidence Ruhl reached the inescapable conclusion that between 300 and 500 deer had died in late winter in the 4,000 acre swamp.

Almost no cedar browse—the winter standby of the whitetails in northern Michigan—remained in the area. Balsam and other foods on which deer cannot long exist showed marked signs of browsing. Dogwood shrubs, young maple seedlings and other undergrowth had been eaten down to the snowline winter after winter.

In a tract of less than forty acres in the Bass Cove district along the Lake Huron shore we found eight dead fawns. Two fishermen headquartering on the Cove told us they had found thirty carcasses in an area of less than a square mile, simply by walking through it and without making any systematic search for the animals.

We left Drummond Island convinced that Ruhl's estimate was sound. Of course if the conditions in the Johnswood Swamp were limited to that one deer yard, if other swamps throughout the State's deer territory did not show the same alarming evidence of over-browsing, if heavy losses had not already occurred in many other districts, the problem would be worth no more than passing notice. Unhappily, however, that is not the case. Drummond Island does not by any means stand alone as the one region in Michigan where the grim specter of winter hunger hangs over the deer herd.

Ruhl declares he can name fifty swamps that confront similar conditions and have already suffered a heavy loss of deer, and he has ample evidence to back his statement.

Early last winter the Conservation Department found wretched proof of similar conditions in yards in Lake and Newaygo Counties, near the southern fringe of the deer country in the western part of the Lower Peninsula. The problem in that district has been complicated and made more severe by a long closed season on deer.

When the deer of the district were shot out nearly to extinction many years ago, a closed season was declared. Public sentiment enlisted behind the ban and it has been retained until the deer are now eating themselves out of house and home. The strong probability looms that an open season will be permitted this coming November, in the hope of thinning the herd, starting it back to the level where its winter range will support it.

Reports of three trained investigators who inspected deer yards in every section of the State last winter bear out Ruhl's contention that the problem of food shortage is widespread. F. C. Gillett, one of the three, reported browse lines and dearth of food in nearly a dozen yards. Another investigator told a similar story of the yards in three Upper Peninsula counties and the third termed conditions "alarming" in the nineteen yards he visited in six counties.

The problem is, of course, not entirely new. It struck in the famed Hulbert yard in the Upper Peninsula in 1928 with disastrous consequences. In the Turtle Lake district, in northeastern Michigan, where private hunting clubs with large holdings and small memberships have served to a considerable extent as game refuges, starvation took its first major toll in 1929 and authorities today estimate the losses as high as ninety per cent of the original deer herd.

But on one point the State's game authorities are agreed. The swath cut by hunger this last winter was deeper than ever before, on the basis of known evidence.

Must Michigan, then, join Pennsylvania as a State that has more deer than food? Are her northern forests about to serve as the stage for a wildlife tragedy comparable to that of the Kaibab deer herd or the Jackson Hole elk, and on a scale much vaster? Will Michigan be obliged to reverse the established machinery of wildlife conservation within the next few years, to kill off the surplus deer and prevent hunger, Nature's grim executioner, from doing the

job too well? The whole trouble, it must be kept in mind, is shortage of winter browse. Michigan has summer deer range aplenty. There can be no simpler way of putting it than to say that the State has approximately twenty million acres of land over which deer may range and find food in abundance from spring to fall, but only about two million acres, game men calculate, where they may find food and shelter in the months of deep snow and cold storms.

Nobody wants starvation to take its cruel course if any workable way can be found to prevent it. Two alternatives seem available wherever there are too many deer and too little food. Either more food must be provided or the number of deer reduced.

It's hardly as simple as that, however.

The State has tried furnishing feed for the deer. Hay has been drawn into the swamps on sleighs and toboggans and scattered to the hunger-worn whitetails. It tides them over, it checks the inroads of starvation. But it also pauperizes the deer, luring them in greater and greater numbers into the already over-crowded yards, and calling for more and more hay.

Hay costs money. To provide enough for the deer herd that gathers in the yards in December from twenty million acres of summer range would cost a lot of money, to say nothing of the difficulties of distributing it, and the question of just how well deer would winter on a diet of straight hay.

That method of artificial feeding holds little hope, whatever else is to be done.

Another scheme was tried last winter and the results were at least more encouraging. The state sent C.C.C. crews into the Luther-Baldwin Game Refuge with instructions to cut small blocks of cedar and other timber on which deer feed, "checkerboarding" the cuttings through the area to provide relief for the starving animals.

There can be no question that the lives of many deer were saved by this plan. Forty-eight hours after a two and a half acre plot had been cut the last shred of browse was stripped from the trees by the ravenous deer, and the men in charge of the work estimated that between 400 and 1,200 animals fed in the cuttings and relied upon them when no other food was available. Such a program calls for large areas of state-owned land in every deer yard, where the cutting can be done, however, and even this plan would be costly on a statewide basis.

Burdocks,—sorry food indeed, but stripped bare of their dead foliage by the hungry deer of the Johnswood yard.

All in all it seems unlikely that Michigan's deer herd can be maintained on dole for very long.

When it comes to reducing the herd the problem is no simpler. One method has been tried on a limited scale. The State has live-trapped deer in over-browsed swamps, using C.C.C. crews for the work, and transferred them to other areas where food was abundant.

But to livetrap deer in wholesale numbers is a big and expensive job and unless they are moved a considerable distance they show a marked tendency to wander back into home territory.

That homing instinct is one of the major trouble-making factors in the whole situation, incidentally. Deer are prone to return to the same yard winter after winter and when their food supplies fail they stay on and starve rather than migrate a few miles to a swamp where plenty of browse awaits them. There is, for example, a swamp on Drummond Island within a few miles of Johnswood, where the cedar has hardly been touched. Yet young deer (*Continuing on page* 483)

Hay will tide them over—check the inroads of starvation—until a better way than artificial feeding is found.

REDWOOD

Sequoia sempervirens (Lambert) Endlicher

THE redwood, whose family covered most of the northern hemisphere before the glacial periods, is now confined to an area of less than 1,500,000 acres. It grows in an irregular strip scarcely thirty-five miles wide and 500 miles long, extending along the west slope of the Pacific coast from the Chetco River in southwestern Oregon to Salmon Creek Canyon, about one hundred miles south of San Francisco in Monterey County, California. The trees grow from sea level to approximately 3,000 feet above the sea, on flats and seaward slopes subject to frequent, heavy fogs.

The redwood and its close Sierra relative the Bigtree, *Sequoia gigantea,* are the largest, and probably the oldest, examples of life in North America, if not in the world. Lambert, of London, published the first description of redwood in 1803, under the name *Taxodium sempervirens,* in the belief that it was related to the southern cypress. In 1847, believing it to be a distinct genus, the name *Sequoia* was given by a German botanist, Endlicher, to honor the half-breed Cherokee chief Sequoyah who formulated an alphabet for his tribe, and *sempervirens* is from the Latin, meaning "always green." It may have been used originally in the assumption that redwood is an evergreen variety of the southern cypress.

Although not as longlived as the Bigtree nor as great in girth, it grows to a greater height than any other American tree. On flats under good conditions it grows to be 350 feet high and from twenty to twenty-seven feet in diameter. The oldest redwood found during investigations by the Forest Service was twenty-one feet in diameter and 1,373 years old. Another tree fifteen feet in diameter and 270 feet high, described by Prof. W. R. Dudley was 2,171 years old. Accurate ring counts cannot be secured without destroying the tree, but it is assumed that redwoods 300 feet high and twenty feet or more in diameter may approach an age of 2,000 years. Most of the redwoods cut in commercial operations are from 400 to 800 years old. These are from three to ten feet in diameter, and 200 to 275 feet tall.

The larger trees have a straight, slightly tapered, heavily buttressed trunk, clear for more than one hundred feet, with an open round topped crown of relatively short horizontal branches spreading with a downward tendency. The crowns may occupy a third to a half of the total length. Those of young trees ten to fifteen inches in diameter are narrowly conical and may extend to the ground.

The sharply pointed, flat, bright, deep yellow green leaves of the lower branches and young saplings stand out stiffly on opposite sides of the twigs and vary from one-third of an inch to an inch in length, while on the main stem of the branches they may occur as several overlapping lines of closely pressed scale-like forms. The leaves of each season's growth may remain on the tree for three or four years, and then cling to the branches for another one or two years after they are dead.

Tiny male and female flowers are on different branches of the same tree. The flower buds form in the autumn near the ends of the previous year's shoots. In the late winter or early spring the staminate flowers develop as small greenish yellow bodies in the axils of the leaves, while the more broadly egg-shaped pistillate flowers are terminal.

By early September of the same year the pistillate flowers mature into dull, purplish brown, egg-shaped cones about an inch long, and half as broad. Closely packed under each cone scale are four or five small russet brown, wing-margined seeds which are shed slowly, and carried comparatively short distances by the wind. They are about one-sixteenth of an inch in diameter and when clean will run about 123,000 to the pound. The cones remain on the trees several months after losing their seeds.

Rearing its crown to heights of over 300 feet, the coast Redwood of California is the taller and more graceful of the two species of Sequoia.

The soft red brown bark of old trees has a grayish hue and is longitudinally fissured. It is fibrous and spongy, may be a foot thick, and is highly resistant to fire. Beneath this is a firm, thin, cinnamon red layer of more closely pressed bark.

Redwood is named for the soft, straight grained, moderately strong heartwood which varies in color from a light cherry to a dark mahogany, as well as for the color of the bark. The narrow sapwood is almost white. Air-dry heartwood weighs twenty-four to twenty-six pounds to the cubic foot. This is similar to the weight of the wood of northern white pine, to which it compares favorably in strength and stiffness. The wood is several pounds heavier than that of the Bigtree and is stronger. It is easy to work, shrinks and swells but little, takes paint well, and resists decay and insects. Railroad ties, tanks, flumes, silos, bee keeper's supplies, shingles, siding, ceiling, doors, general mill work and furniture are among its chief uses. Efforts have been made to manufacture fiber board for insulation and other purposes from the thick, fibrous bark.

Recent estimates indicate the region contains about fifty-seven billion board feet, although in 1909 there was estimated to be over one hundred billion board feet. In 1934, the commercial cut of redwood was reported as 282,149,000 board feet, but from 1900 to 1930 the average annual cut was close to 500,000,000 board feet. Individual acres yielding over 100,000 board feet of saw timber are not infrequent, and some acres of unusually large trees are reported to have produced a million board feet.

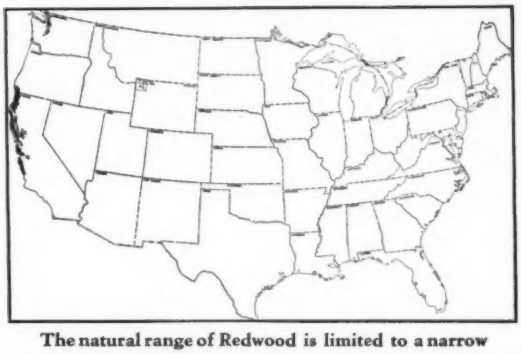
Although many seeds are produced nearly every year only fifteen to twenty-five per cent are perfect and the germination is low, so that reproduction would be poor were it not for the many vigorous sprouts which are produced from the stumps, root collar and roots of old as well as young trees. This quality, combined with the successful efforts to include redwood groves in national and state parks as well as in National Forests give assurance that the commercially important redwood may not be lumbered to extinction.

None of the ordinary wood rotting fungi grow in redwood timber and the tree is singularly free from fungus diseases. A so-called brown rot is the only known disease of the trunk. This causes portions of the butt to assume the properties of charcoal and to crumble into a fine powder. It is, however, so limited as to cause little concern. Similarly, there are no insects that cause material harm and the wood is immune from the attacks of termites. Even fire does relatively little damage to trees which have acquired a thick bark, but the young growth is killed or seriously injured. The frequent "goose pens" in the larger trees are evidence that persistently repeated fires will make inroads upon them, and at the same time, of the amazing ability of the tree to maintain life, by healing over injuries wherever living tissue remains.

Redwood requires a moist, cool climate of high humidity as shown by its dependence upon the Pacific coast fogs. It does not thrive in a dry or warm climate, but will stand temperatures ranging from 15 to 100 degrees Fahrenheit. The best stands are on protected flats and benches along streams or on moderate west slopes opening toward the sea. Thirty to sixty inches of rain falls in the autumn and winter and sea fogs bathe the region in summer. It grows in mixture with Douglas fir, tanbark oak, Sitka spruce, Port Orford cedar, western red cedar, and western hemlock. Where conditions are favorable the redwood leads all of these in the struggle for growing space. Efforts to grow redwood out of its present range have met with little success.

The bright yellow green leaves of the lower branches stand out stiffly on opposite sides of the twigs and remain on the tree three or four years. Those on the main branches are scale-like. The egg-shaped cones are scarcely an inch long and mature in a single season.

Redwood bark is reddish gray in color, fibrous in texture and gives a fluted appearance to the tree.



The natural range of Redwood is limited to a narrow strip extending along the Pacific Coast from southwestern Oregon for about 500 miles into California.

FIELD AND FOREST FOR BOYS AND GIRLS

This giant bullfrog tipped the scales at three pounds!

MASTER BULLFROG

Photographs by the American Frog Canning Company

By HARRY EDWARD MILLER

NO properly equipped frog and toad orchestra, with its croakers, pipers, fluters, tenors and bassos, would be a praiseworthy combination without the shrill soprano of the little hyla frog, or "spring peeper," from that ranging all the way down the scale to the deep throated rumbling of Master Bullfrog. He is truly the base fiddle of the organization; and up through the memories of childhood comes dreamingly his voice out of the mist of years into the city ways—a voice sounding perhaps far and not without melody from a reed and brush-grown country pond.

Frequently his hoarse remarks are more to be admired at a distance than close at hand. They do on occasion rise to a sonorous, full throated, bellowing character reminding one of the angry complaints of a challenging bull, hence leading the pioneers in America to apply to the amphibian his distinctive name. He does not favor chorus work as do various frogs and toads so vocal in spring and summer. The bullfrog is more of an independent singer. He may call from his place, being answered by another of his kind; he will be loud spoken for a period, then persistently silent, not keeping up an incessant clamor like the wood-frog or the hordes of so-styled "spring peepers."

There is quite an industry in raising giant frogs for the market—this woman frog-farmer has built a beautiful pool in her backyard.

His most musical call was likened generations ago by many human listeners to the words: "Jug-o-rum! Jug-o-rum! Jug-o-rum!"; to other listeners the deeply nasal notes sound as though the frog was saying, in a long drawn out fashion: "Go-a-round! Go-a-round! Go-a-round!"

The bullfrog is not limited to this call, for he will utter croaking notes when in the mood; furthermore, his vocabulary is increased by a terrifying, almost human-like scream, a startling cry sent forth when the amphibian is frightened. To find anything in nature to compare with that blood-curdling sound,—the mystical, horrifying clamor of the spade-footed toad, must be considered the weird shriek of the great-horned owl; the awe-inspiring, unearthly wail of the red fox at midnight; or the uncanny yowling of a wild-cat in the depths of the forest after daylight hours have gone.

Tame bullfrogs are among the most engaging of reptile pets. Even in captivity they will not refuse occasionally to express themselves vocally. It is unwise to confine bullfrogs in an aquarium or other enclosure where fish, smaller frogs, or toads are dwellers, since Master Bullfrog has certain cannibalistic tendencies. His bill of fare is a greatly varied one. It comprises in his native haunts not only toads

and frogs, but small fish, small snakes, worms, crayfish, small turtles, salamanders, water insects of many kinds, snails, shrimps, larvae of dragon-flies, mosquitoes, Mayflies, mice and other small rodents. Bullfrogs may even seize small water birds at times, particularly if the frog happens to be of unusual size. Indeed, the list could be considerably lengthened. But at the same time, of course, this amphibian has a dozen or more enemies ready to make a meal of him.

Raising frogs is an interesting hobby, is not difficult, and can be made to pay. This frog-farmer is looking over his "crop."

Those acquainted with the habits of the bullfrog have learned he often favors deeper water and is more aquatic than many of his frog neighbors. Millponds, lakes, rivers and coves attract the bullfrog. He does not care to stray far from these except on unusual occasions, and many times he may be seen in such waters, perhaps with just his head or part of it protruding above the surface. Disturbed, he drops quietly below; soon he may appear at a marked distance, possibly surveying the scene with no more than his nose and eyes displayed. He often has favorite perches where he basks at leisure—on some stone, log, or stump rising slightly out of the water.

There are seasons when bullfrogs are observed some distance from the water closest at hand; especially in the mating season do wandering moods apparently control them. Again, these frogs have been described as marching with considerable armies from one pond to another, though there is no reasonable explanation for this change of residence.

All frogs and toads have there enemies, and Master Bullfrog shares fortunes with the rest of his cousins. He is a choice tidbit for large fish, and smaller fish seize smaller frogs; the same is true of snakes, turtles, hawks, owls, water birds, skunks and several other of the bird and animal creation. He has more dangers still since he frequents deeper water than most frogs; those smaller amphibians seem to know enough to favor shallow water where enemies are not so numerous.

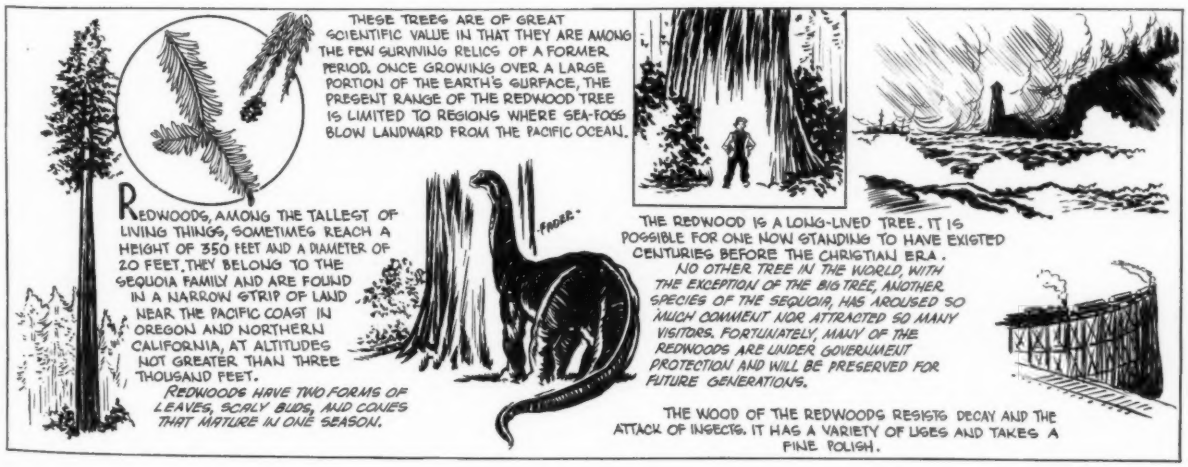
In all the croaker realm, the bullfrog is not likely to be confused with any frog unless the much smaller meadow-green frog, inhabiting often the same waters where the bullfrog is found. Master Bullfrog is the largest of all the more than two thousand varieties of frogs and toads known to the world, with the one exception of the monster specimen in French West Africa, a frog described by the naturalist, Dr. Thomas Barbour, as "heavy as a good sized terrier."

Bullfrogs do not, ordinarily, cease to grow before their fourth year, and are at breeding maturity when three years of age. Individuals have been recorded by responsible authorities that weighed more than seven pounds, measuring a foot and a half in length. Owing to its size, the bullfrog is a favorite for supplying frogs-legs, that table delicacy of epicureans, a savory dish relished by the ancients as early as the old Roman empire. Frog farms are maintained in certain communities to cater to the trade.

In spite of some giants mentioned among their kind, the average size of what we call large bullfrogs is not over seven or eight inches, males (*Continuing on page* 488)

TREES AND THEIR USES

No. 18 - - - REDWOOD



AROUND THE STATES

WITH

THE AMERICAN FORESTRY ASSOCIATION

Drought Committee Blames Homestead Laws—Advocates Long-Term Program of Readjustment

A mistaken homesteading policy, wartime demands which stimulated over-cropping and over-grazing, and the encouragement of a system of agriculture which could not be both permanent and prosperous, were given by the President's Great Plains Drought Area Committee, in its report of August 27, as the primary causes of that region's present emergency, which has been felt over a wide territory in the form of dust storms and economic disaster. The Homestead Act of 1862, limiting an individual holding to 160 acres, is characterized by the committee when applied to Great Plains conditions as "almost an obligatory vow of poverty."

"If we allow the Great Plains to become an economic desert," warns the committee, "our democracy is endangered." The problem, the report concludes, involves more than the 2,500,000 people now living on farms. It extends to nearly 10,000,000 who are in the states affected, and ultimately reaches the more than 120,000,000 people of the nation. "The basic cause of the present Great Plains situation," reiterates the report, "is an attempt to impose upon the region a system of agriculture to which the plains are not adapted—to bring into a semi-arid region methods which on the whole, are suitable only for a humid region.

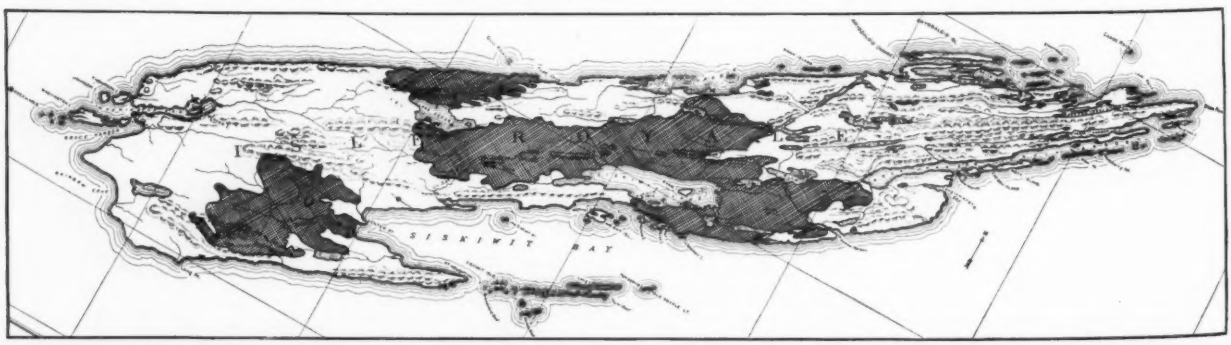
"Fortunately or unfortunately," reports the committee, "the settlement of the Western Plains occurred at the end of what appears to have been a forty-year dry period and at the beginning of a wet period which has apparently terminated." While these climatic attributes, which cannot be altered by any act of man, may slowly become changed for better or worse, by natural weather cycles, it is pointed out in the report that "the stripping off of the mellow top soil by unrestrained erosion, down to less absorptive, less tractable sub-soil, is the equivalent of an unfavorable soil-climate change." Thus by excessive plowing and overgrazing, the natural cover of millions of acres has been destroyed, and the loose soil exposed to the winds, and to washing by the rains. In many parts of the area there has been a decline in the ground water level. The committee estimates that eighty per cent of the Great Plains area is now in some stage of erosion, and that fifteen per cent has been seriously and permanently injured.

With this in mind the committee emphasizes that basic to all other objectives of a program in which the Federal Government must take the initiative with the fullest cooperation of the states and local governments, is to "arrest the wastage of soil by erosion and make efficient use of the water resources of the region," for—"in a land of little rain it is imperative that water should never be allowed needlessly to go to waste."

The program which would render future droughts less disastrous, offered by the committee, emphasizes that this is a long-term program of readjustment and reorganization in which nothing proposed is expected or intended to impair the independence of the individual farmer. It is designed toward the most efficient utilization of the natural resources of the Great Plains area.

To the end that the practices which have destroyed the sod and dessicated the soil will be changed or abandoned the committee recommends strip cropping and the planting of shelter trees, contour plowing, listing, terracing, and such soil conserving practices as re-grassing. The continuation of public acquisition of lands is supported, and the suggestion made for the consideration of possibilities of legally restraining owners from using their holdings in ways which will ultimately destroy them or endanger neighboring property. Other recommendations are of a social and economic nature such as would modify unsound tax systems, encourage regroupings of populations and stabilize land tenure.

Morris L. Cooke, Administrator of Rural Electrification Administration, is chairman of the committee, which includes Hugh H. Bennett, Chief of Soil Conservation Service; Frederick H. Fowler, Director of Drainage Basin Study, National Resources Committee; Francis C. Harrington, Chief Engineer of Works Progress Administration; Harry L. Hopkins, Administrator of Works Progress Administration; Richard C. Moore, Corps of Engineers, U. S. A.; John C. Page, Acting Commissioner of the Bureau of Reclamation; Henry A. Wallace, Secretary of Agriculture, and Rexford G. Tugwell, Administrator of Resettlement Administration.



Fire-swept Isle Royale—one-fourth of the land area of the proposed National Park in Lake Superior was burned over in August. The shaded sections of the map above indicate the burned area, 36,000 acres in extent. **(Story on page 474.)**

THE THIRD INTERNATIONAL POWER CONFERENCE AND ITS RELATION TO FORESTRY

By COLONEL JOSEPH HYDE PRATT

The Third International Power Conference was held at Washington, D. C., September 7 to 12, and in attendance there were approximately two thousand delegates from fifty countries, all interested in some phase of power development, production, utilization, or conservation.

Eighteen subjects or papers were presented, and the number of papers prepared for each subject varied from six to twenty-one, with an average of thirteen. The members preparing their papers were from twenty-nine countries, as follows: Algeria, Argentine, Austria, Belgium, Bulgaria, Brazil, Canada, China, Chile, Costa Rica, Czechoslovakia, Denmark, France, Germany, Great Britain, Holland, Hungary, Italy, Japan, Mexico, Norway, Poland, Roumania, Russia, Spain, Sweden, Switzerland, Union of South Africa and the United States.

That forestry problems should be considered and discussed at a power conference may at first glance be thought out of place, but this is far from being the case. In fact, it is highly appropriate for one type of power so largely dependent on forests for its continuance—water power. And it was largely in connection with subjects relating to this type of power that forestry was considered.

There were two general subjects under which the discussion of forestry problems were considered. These were national and regional planning for the most efficient utilization of natural resources and special problems in regional planning.

While most of the authors considered and discussed these subjects principally from the power standpoint, several, however, realized the dependence of water-power on the preservation and conservation of forests, the prevention of erosion and soil conservation, and so stated. These references were principally from Swedish and American authors.

The principal papers that dealt with problems that had a relation to forestry were: "Planning for Natural Resources in America," by Stuart Chase; "National and Regional Planning and their Relation to the Conservation of Natural Resources," (Norway), by Professor Ingvar Wedervang, Ph.D.; "Alluvial Deposits in Reservoirs, Their Importance and the Means to Lessen or Prevent Them," (Italy), by Professor Ing. Macao Visentini; "National and Regional Planning and their Relation to the Conservation of Natural Resources," (United States) by W. S. Finlay, Jr.; "Utilization of Small Water Powers," (United States) by H. H. Bennett; "Silting of Four Large Reservoirs in South Africa," by A. D. Lewis; and "Toward Stability in Our Natural Resources," (United States) by T. W. Norcross.

Mr. Chase referred to "our national policy" as one which had been to rid "the Republic of all responsibility for the Public Domain as rapidly as possible." Save for the area of the original Thirteen Colonies, the nation has owned and then practically given away the rest of its territory, except some poor land which it retained, he said. In recent years, however, the government has been buying back portions of "its largesse at very substintial figures per acre, in an attempt to check the gross waste and mismanagement of unrestricted exploitation." The recipients of the government bounty have considered that they had an inalienable property right to perpetuity and that the government could in no way supervise land or water use.

The result, Mr. Chase states, has been: That pulling pillars in an ore mine has caused the collapse and destruction of farm land above. That dumping refuse in streams has been a detriment to, if not poisoning of, communities further down the line. That pumping of great quantities of underground water, which may have benefited a given land owner, has been at the cost of lowering the water table for the whole community. That the stripping of forests and the misuse of land in the headwaters of streams has resulted in disastrous flood down stream, siltage of reservoirs, and decline in power head below. That bad agricultural practices have encouraged erosion and filled neighboring farms with gravel and waste. That burning over private grass lands has often started runaway forest fires.

Mr. Chase said: "After three centuries of irresponsible exploitation, nature's bins are empty over great areas, while the cumulative speed of technological change has deprived other communities of the means of livelihood," and asked: "How long can man violate the ecology of a continent?"

If man is to continue living on this earth and his children after him, he must not violate indefinitely the balance of nature, he said. Under natural conditions land and water resources are in nicely articulated adjustment; but if the adjustment is upset, the resources decline, usually, at a progressive pace.

The first white men in North America found a continent in equilibrium; but three hundred years later the continent is all but unrecognizable. National resource planning is necessary and, according to Mr. Chase, our aim should be to:

1. "Hold soil, water, forest, grass at par. Over any reasonable time period, never allow net depletion. Keep inflow balanced against outflow.

2. "For minerals, keep the rate of exploitation at a minimum, by rigid prevention of needless waste, and by research in the field of substituting minerals abundant in the earth's crust for those which are rare.

"On these two principles, the resource base remains solid to perpetuity in respect to land and water, declines at a minimum rate in respect to minerals."

In carrying out this planning certain principles must be conceded. Under forest principles, a permanent yield of raw timber; annual growth for the nation as a whole if not for a given region; forest management to preserve soils against erosion, to halt forest fires, to keep water supplies pure, to keep floods at a minimum, to hold levels of artesian basins, to maintain wildlife and fisheries, to promote recreation; and the use of tree crops—nuts, persimmons, mulberries, etc.,—as food for man and beast.

Under grass principles, a permanent yield of pasture for animal food, strict regulation against overgrazing, and consequent destruction of the sod; and grass management, like forest management, to preserve soils against erosion—both wind and water—to safeguard water supplies and for flood control.

Under crop land principles, the preservation of the physical soil against erosion by terracing, strip planting, contour plowing, crop rotation and the avoidance of slopes running higher than five per cent.

Under marsh land principles, never drain marshes unless the need is very urgent—either for food supply or mosquito control, as marshes constitute natural reservoirs for flood control and are far cheaper than dams and artificial reservoirs, are the natural

breeding grounds of wild fowl and of certain fur bearing animals, and as the drainage of marshes has proved costly folly in great areas of Wisconsin and Minnesota.

Mr. Chase believes that if the above principles are followed that the terms of nature will be met; and a region or a continent will no longer go down hill. The principle of balance is sound, but the introduction must be gradual, accompanied by a great program of reforestation in cut-over areas, and on lands now in crops which should go back to forests. Some day the metals may be gone, but land and water go on forever; if we care to work with nature, their values need never decline and are our real protection.

Mr. Norcross in discussing Mr. Chase's and other papers was largely in accord with the forestry and land-use principles of Mr. Chase; and he stated that one of the ultimate aims of land-use planning for the conservation of natural resources is to so regulate land-use, that, within reasonable limits, the production of materials and service—and that includes the production of power—from the land's natural resources may become a calculable quantity; but to reach this point a coordinated national program of land-use planning and adequate land management is required.

It is assumed that forest land in its primeval state preserves what may be termed a natural balance.

Mr. Norcross calls attention to the influence of forest cover and range vegetation in checking excess run-off of rains, thereby aiding to control floods and erosion, in decreasing the silting of reservoirs, and in maintaining a higher primary power in water power development. He also believes that more submarginal land should be brought into forested areas, and that larger areas of forest land should be brought under federal or state control, if the desired results are to be obtained. He stated that present conditions have been brought about largely by the misuse of land, but that they can be rectified through efficient land-use planning.

In closing his discussion, Mr. Norcross made the following statement: "Land misuse resulting in complete upset of the balance preserved by nature has precipitated national catastrophies throughout the world. Devastation of productive land areas has often reduced entire peoples to a near-savage state, has been at the root of disorders and forceful reorganizations ranging from tribal movements to wholesale migrations and disastrous wars. History is full of class uprisings, bitter and long drawn out, which are in many cases easily traceable to land misuse and unbalanced land ownership. The protection of the nation from any degree of such disturbances is, of course, the duty of those in whose hands rests the responsibility for land-use management and planning."

In connection with the papers on the silting of reservoirs and utilization of small water powers, the need of forest protection and conservation on the head waters of our streams, and the need of soil conservation and erosion control were emphasized.

The amount of elective energy that will be produced from water power in the future will depend largely on whether or not our forest areas are maintained, protected and conserved.

FIRE DESTROYS ONE-FOURTH OF ISLE ROYALE

One-fourth of the land area of the proposed Isle Royale National Park area, in Lake Superior, was burned over in the fire which started on July 25 in slash left after a recent lumbering operation on the island. The fire, which is believed to have been started by a picnicker, burned between 32,000 and 36,000 acres of the 132,000 acres of land and lakes included in the island.

About 1,600 C.C.C. enrollees and sixty skilled supervisors from the National Park Service and the Forest Service struggled during most of August for its control. It was not considered to be safe until a period of protracted rain on August 28. The area is described by Chief Forester John D. Coffman, who was present during the most critical periods, as the "toughest in the United States in which to provide fire control on a large scale."

In addition to the isolated location of the island, whose only contact with the mainland is by boat or airplane, the fire occurred during a period of high winds, extreme dryness, and low humidity, and was further complicated by the lack of adequate equipment. Only a small portion of the island is provided with roads, so the men were frequently required to walk miles before reaching the fire. Supplementing the boats which were chartered for the emergency, Navy amphibian planes were used for spotting the fires and directing the crews, and a network with eleven radios was set up.

No reports have been received as to the extent to which old forest growth was destroyed, but the fact that the fire mounted into the tree crowns on a number of occasions indicates its severity.

WYCKOFF NEW DIRECTOR OF FOREST EXPERIMENT STATION

Stephen N. Wyckoff, for thirteen years in charge of the Western Office of Blister Rust Control of the Bureau of Entomology and Plant Quarantine, has been appointed director of the Northern Rocky Mountain Forest and Range Experiment Station with headquarters at Missoula, Montana. He succeeds Lyle F. Watts, who recently became Regional Forester for the Central States Region, with headquarters at Milwaukee, Wisconsin.

The bulk of the recent blister rust control work carried on by Mr. Wyckoff has been in cooperation with the Forest Service, the State of Idaho, timberland owners in the Inland Empire, and the C.C.C. The regular appropriation of about $500,000 has been supplemented during the past two years with allotments totaling over $6,000,000 from the Works Progress Administration.

Mr. Wyckoff is a graduate of the University of California, and received his original appointment in the Department of Agriculture in 1919. He has had a varied experience in research, administrative and technical positions.

He is widely recognized as a leader in the field of white pine blister rust control and for his service to conservation in the Northwest. He brings to his new position a wide background and understanding of the economic and silvicultural problems of the West and, particularly, of the Northern Rocky Mountain region.

The Northern Rocky Mountain Forest and Range Experiment Station is carrying on investigations in forest management, range management, fire protection, and other forest problems in the region comprising Montana, northern Idaho and eastern Washington.

New Forest in North Carolina

A new National Forest, the Croatan, in the tidewater and coastal plains region of North Carolina, has been established by proclamation signed by President Roosevelt.

Three-fourths of the 14,417,000 acres of the Coastal Plains of North Carolina are potentially productive forest lands. Because of the extent and location of this region as a potential timber producing area and the need of a National Forest for demonstration purposes, the Forest Service has planned important undertakings in forest management in the new unit.

The Croatan National Forest lies in the Coastal pine forest area south of the lower course of the Neuse River, whither may have fled the refugees from the lost colony of Sir Walter Raleigh on Roanoke Island years before the successful Jamestown colony was planted in Virginia. Ships from England found in the ruins of Roanoke Colony a sign pointing to "Croatan," supposed to have been the name of an Indian town or a tribe living near Ocracoke Inlet, where the early colonists' ships entered the sound on the way to Roanoke Island.

The new National Forest includes within its boundaries about 306,000 acres, of which 113,000 acres have been bought or are in process of purchase by the United States. Of the gross area, recent surveys place 109,200 acres in Carteret County, 125,300 in Craven County and 71,800 in Jones County. The area is naturally productive of trees and still contains some good stands of pine. Most of the forests have been cut-over, however, and some of the land will need replanting. Under Forest Service administration, second growth stands and new planting will be protected and managed for production of continuing timber crops.

Before 1742, the Croatan area was the center of naval stores production in America. For more than a century thereafter, farming developed. As the plantations declined, most of the land restocked to pines, or to hardwoods in the river bottoms.

Fires in Glacier National Park

More than 7,500 acres of forest in the heart of Glacier National Park and several government buildings were destroyed during a fire which started on August 25 and was not under control until the fall of heavy rains on September 3. The fire, which was started by lightning on McDonald Creek spread fan-wise from the Crossed Glacier wall through Logan Pass and down toward Many Glacier Hotel. It was described by Superintendent E. T. Scoyan as the worst in the history of the park, having killed large areas of green timber and ruined some of the most accessible scenery.

By September 1, with a thousand men on the line, high winds blew the fire out of control, started spot fires for miles around, and made necessary the evacuation of all guests from the hotel, the housekeeping cabins, and the public camp sites. Although the Many Glacier Hotel was saved, practically all the government buildings were destroyed.

All the available C.C.C. men from three camps were used, in addition to about 600 men who were recruited from the Forest Service and nearby towns. By September 3, following an eight hour rain, it was possible to reduce the force to the C.C.C. enrollees, the regular National Park fire-fighting personnel, and the supervisory men who had been loaned by the Forest Service.

State Foresters to Meet in Wisconsin in October

The Association of State Foresters' Annual Meeting will be held in Madison, Wisconsin, October 28 to 30. The open meetings will be in the Wisconsin State Capitol, followed by a dinner. A two-day tour of State Parks, forest protection districts, secondary ranger stations, state forest nurseries, and the plantations of the Nekoosa-Edwards Paper Company will be made on the 29th and 30th.

Metropolitan News Photo

AERIAL ANTELOPE

Miss Betty Schlitz, of the United Air Lines, feeding a herd of twenty-three antelope just before they were flown from Pitchfork, Wyoming, to various sections of the country. Two of the animals were placed aboard the Hindenburg and flown to Germany. The donor, at right, is Charles J. Beldon, rancher.

SAPLING SAM'S COLUMN

Something New in the World

It seems they have a new system of planting down on the Symmes Creek Unit of the Wayne Purchase Units in Ohio. They have a fellow with wooden legs going along and put the seeds in his foot prints. They did try two fellows with one wooden leg apiece but it seems the spacing was too far apart.

—*Bulletin North Central Region.*

Exactly So

"If a goat swallowed a rabbit, what would be the result?"

"A hare in the butter."—*Kablegram.*

As the departing geranium said to the bright red rose, "I'll be zinnia!"

——*Kablegram.*

There is little danger of forest fires where the only sap present is in the trees.

—*Kablegram.*

Poor Correspondents

Passer-by to angler: "How are the fish in this stream?"

Angler: "I really don't know, I've been dropping them a line every day, but I haven't had any answer yet."

An Extinct Species

Teacher: What is a swamp?

Eager Pupil: A swamp is one of those ducks with a long curly neck.

A sign board approximately five feet by three feet is reported to stand beside a country road a few miles from Worcester, Massachusetts with the following inscription:

"Town of Shirley, Mass.
Capt. Nathan Smith 1737-1834
Second in Command in the Shays Rebellion.
His last wish was that he might be buried
in a hemlock coffin, that he might go
'snapping through Hell'."

A "sugar daddy" is a form of crystallized sap.—*Texas Ranger.*

The Modern "Smith"

Beneath the spreading chestnut tree,
The smith works like the deuce.
For now he's selling gasoline,
Hot dogs and orange juice.

NO Accident

Lt.: "Ever been sick?"

Enrollee: "Nope."

Lt.: "Ever had any accidents?"

Enrollee: "No, sir."

Lt.: "Then how'd you get that scar on the back of your hand?"

Enrollee: "A rattlesnake bit me."

Lt.: "And you don't call that an accident?"

Enrollee: "Nope. The son of a gun did it on purpose."

RUSSELL NEW PARK WILDLIFE CHIEF

Announcement of the appointment of Dr. Carl P. Russell, of California, formerly chief of the Museum Division of the National Park Service, to the position, Chief of the Wildlife Division, left vacant last February through the death of George M. Wright, killed in an automobile accident, was made August 21 by A. E. Demaray, acting director of the National Park Service.

Although his energies in recent years have been focused upon the development of a museum program for the National Park Service, Dr. Russell's early interests were in naturalist work, and his contributions to the cause of wildlife conservation have been many.

Graduating in 1915 from Ripon College, Wisconsin, Dr. Russell spent the ensuing two years in graduate studies at the University of Michigan.

In 1923 Dr. Russell entered the National Park Service at Yosemite National Park. He was first a ranger-naturalist, then a park-naturalist. During this period he organized a permanent staff of educational officers, expanded the program of ranger-naturalist activities and participated in the founding of one of the first adequate museums in National Parks.

In January, 1935, Dr. Russell was called to the Washington Office.

STARTING A PROGRAM OF FOREST TREE SELECTION

By JOHN W. HERSHEY

Recently considerable interest has been taken in the value of selecting rapid-growing strains and hybridizing of species for forest planting. An illustration is the work done by Dr. Ernst J. Schreiner in hybridizing the poplars under the auspices of Dr. A. B. Stout of the Bronx Botanical Garden, New York City, creating rapid-growing strains whose primary use is paper pulp. In addition to this, considerable thought is being given to that of a first-class timber species producing food for game or domestic life that will offset the carrying charges in forestry.

In an article by Willard G. Bixby, which appeared in AMERICAN FORESTS a few years ago, the following figures are presented: If a $14 per acre investment is made in planting a forest, 6 per cent interest and 2 per cent taxes on this $14 will compound to $656 in fifty years. If rapid-growing species are used so that the same amount of growth is attained in twenty-five instead of fifty years, the cost of carrying the forest per acre would amount to only 15 per cent of this $656, or $98.40. Add to this, selected strains of acorns, improved walnuts or hickories that will fatten one hog per acre or carry a profitable crop of game in the form of deer and bear, or grouse, pheasants and turkeys that eat the small acorns. In addition, a revenue can be obtained from the sale of improved walnuts and hickories, or at best, help sustain life for forest dwellers. One can see the incentive present to stimulate forest planting.

Two phases, equally important, control the great program of reestablishing forests in America. One is the reforesting of public-owned land. However, the "fly in the ointment" is—how well is the taxpayer sold on the idea? If foresters are able to present profit-showing figures to the taxpayers, there will be a much greater stimulant for them to back this reforestation movement. A program showing returns in a few years can be "sold" to the individual much more quickly than one showing possible future returns, now presented in the form of controlling floods, retaining soils, and keeping a climatic balance. I do not mean to belittle these issues; we know that they are of vital importance to national economy, but it isn't what you or I think in the matter, it is what the taxpayer thinks. Therefore, why not develop a program that will show immediate profit, enticing the taxpayers to give it full support?

The other phase is that of reforestation by private land-owners. In a well-balanced agricultural economy in any prosperous community, a small woodlot is recognized as a necessity, but this is generally held to a minimum size only for the purpose of producing firewood for the farmer, with timber enough to repair buildings or possibly erect an additional one now and then. But if selected rapid-growing mast or nut trees are available that will permit the farmer to produce salable timber in half the normal time, and create permanent fall and winter pasture for his hogs, there will be a much greater stimulant for private reforestation to proceed. This logic would sell the large lumber or coal mining corporations much more quickly than the present argument of the future good reforestation might do in soil conservation and climatic balance. Regardless of the idealism of a few, the average John Q. Citizen is interested in results obtained for personal benefit during his "life cycle."

The Tennessee Valley Authority program of forest tree breeding will develop untold values for future forests, but a program of strain selection can be initiated immediately by all forestry departments, whether state or Federal, along the following lines: Start a seed block of selected strains of rapid-growing, mast-producing trees. Years of observation and testing have proven that the Thomas black walnut and the Green River, Posey, and Major pecans are superior in sturdiness and rapidity of growth to any other varieties or seedlings tested.

The increased consumption of nuts is draining heavily on the wild walnut supply, which is evidence that it will be of merit for any landowner, either large or small, to plant nut trees. As this nation hits the steady pace of having to create what it needs, rather than living off unpaid-for natural resources, I see the turning to forests for foods that have a low cost of production. Millions of trees of improved strains of black walnuts and pecans will mean much in this economic cycle.

Patches of fertile areas are available on all such land where an orchard of these trees can be given good cultural care at low cost. In a few years they will start to produce seed from which seedlings can be grown, to be planted either in public lands or distributed as other forest trees are distributed for planting on private lands. True, these seedlings will not produce as high quality nuts as the grafted tree, but it is known that superior parents produce superior offspring, and seedlings grown from this long-tested stock will give better walnuts or pecans than those grown from common seedlings, plus a much more rapid-growing timber tree. This movement can be initiated by planting 100 or 500 or 1,000—as many trees as there are funds available for this work. As other new and select rapid-growing species become known, the area designated for selected strain seed trees could be added to.

Of all the phases of forestry work that can be considered, strain selection is one of the most valuable to be initiated at the present time.

Book Reviews

KEY TO WOODY PLANTS, by Walter Conrad Muenscher. Published by the author. Order from W. C. Muenscher, Department of Botany, Cornell University, Ithaca, New York. Fourth Edition, revised, 105 pages. Price $1.00.

This simple, compact, easily understood set of "Key to Woody Plants" covering nearly all the native, naturalized, and more commonly cultivated trees and shrubs of the region north of Virginia and east of the Mississippi River, offers much needed assistance to all who would know the woody plants of that region.—G. H. C.

INSECT ENEMIES OF SHADE TREES, by Glenn W. Herrick. Comstock Publishing Company, Ithaca, New York. 425 pages, 340 illustrations. Price $5.00.

With the background of a great many years of close identification with shade tree problems, primarily while engaged in the teaching of economic entomology at Cornell University, Professor Herrick has written an authoritative manual on the insect problems of shade trees which will be found indispensable to those engaged in all phases of the care of shade trees. The book is written in that clear, simple style which characterizes all of the publications of the author and which makes it easily understandable to those with limited knowledge of entomology. The book is beautifully and copiously illustrated by drawings and photographs.

The first three chapters of the book are devoted to a general discussion of the broader aspects of the insect problems of shade trees and the usual methods of handling them. These chapters are followed by 27 chapters, each dealing with the insect problems of an important shade tree or a group of closely related shade trees. The author does not confine himself to the situation in northeastern United States. For this reason, the information on the nature of the pests, their life histories, the manner in which they injure shade trees and the latest control procedures will be found of value to professional and amateur arboriculturists everywhere in the United States. The value of the book is considerably increased by a very satisfactory bibliography for each important insect pest and by detailed indices.

Because the author has been successful in putting some of his own enthusiasm and love for shade trees into this new book, tree lovers everywhere will find the reading of Professor Herrick's latest book both pleasurable and helpful.—A. J. J.

FIELD MANUAL OF TREES, by John H. Schaffner. Published by R. G. Adams & Company, Columbus, Ohio. 160 pp. $1.50, postpaid.

This little book is a revision and enlargement of the author's former work on the trees of Ohio and surrounding territory and it covers the northern United States, including southern Canada, to the southern boundaries of Virginia, Kentucky and Missouri and westward to the limits of the prairies. With such a convenient guide as this—in which the keys are very complete and technical elaboration avoided, the study of trees becomes a pleasant and profitable occupation at any season of the year.—L. M. C.

FORESTRY QUESTIONS SUBMITTED TO THE AMERICAN FORESTRY ASSOCIATION, 919 17TH ST., N. W., WASHINGTON, D. C., WILL BE ANSWERED IN THIS COLUMN. . . A SELF-ADDRESSED STAMPED ENVELOPE ACCOMPANYING YOUR LETTER WILL ASSURE A REPLY.

+ + +

QUESTION: For the last few summers, our horse chestnut tree has had some sort of disease in which the leaves begin to lose their chlorophyll and shrivel up, turning a yellowish color. This disease begins about the middle of June when the leaves are full grown and works from the center of the tree out towards the branches. All the central leaves are gone, exposing the bare branches tipped with green leaves upon which the disease has made a little headway. Any information about the cause of this condition and its cure will be appreciated.—F. M.—New Jersey.

ANSWER: This is probably a fungus disease known as leaf blotch, common wherever horse chestnut or its related species grow. It is usually carried over from one growing season to the next on dead leaves and twigs which fall to the ground. Partial control for the next season can be effected by collecting and burning the discolored leaves as rapidly as they fall, but will do no good during the current year.

Satisfactory results have been achieved by spraying the trees with one gallon of lime-sulphur solution to fifty gallons of water, or with Bordeaux mixture in the late spring and summer. Partial control has also been effected by covering the trees with a dust mixture containing ninety parts of very finely ground sulphur and ten parts of very finely powdered arsenate of lead. Finely ground gypsum may be substituted for arsenate of lead, because its primary function is to stick the sulphur dust to the foliage.

QUESTION: I would like to get some illustrated books dealing with the two varieties of Sequoia—those of the mountains and those of the California coastal region. R. S. A., South Australia.

ANSWER: The following books have been recommended by the Save-The-Redwoods League of San Francisco: "Big Trees" by Walter Fry and John R. White; $2.00; Stanford University Press, Palo Alto, California. "Manual of Pacific Coast Trees" by McMinn and Maino; $3.50; University of California Press, Berkeley, California. "The Trees of California" by Willis L. Jepson; $3.00; Paul Elder Book Store, 239 Post Street, San Francisco, California. "Trees of the Yosemite" by Della Hoff and Mary Tresidder; $2.00; Paul Elder Book Store, 239 Post Street, San Francisco, California.

In addition the League can furnish the following pamphlets at ten cents each: "Story Told of a Fallen Redwood" by Emanuel Fritz. "Redwoods of the Past" by Ralph W. Chaney. "A Living Link in History" by John C. Merriam. "Trees, Flowers and Shrubs of the Redwood Region" by W. L. Jepson. "Bibliography of the Redwoods," foreword by J. D. Grant.

Duck Hunters Allowed Thirty-Day Open Season

Duck hunters will have thirty days of hunting this fall under restrictions equally as rigid and drastic as those in force last season. Last year also the hunters were allowed only thirty days.

The new Migratory Bird Treaty Act regulations announced August 14 by the United States Department of Agriculture were recommended by the Biological Survey, adopted by Secretary Wallace, and approved in a proclamation by President Roosevelt.

"These new regulations," says the Biological Survey, "continue stringent restrictions on the hunting of waterfowl in order to cut down the annual kill. The restrictions put into force last year were intended to bring about a reduction in the kill and they accomplished that purpose."

Regulations for this season are summarized by the Survey as follows:

Three zones—northern, intermediate and southern—have been approved for waterfowl hunting. Last year there were two zones, the northern and southern.

In the northern zone the season this year opens October 10 and closes November 8, in the intermediate zone the season is November 1 to 30, and in the southern zone, November 26 to December 25.

Three important species of waterfowl, the Atlantic brant and redhead and canvasback ducks, have been placed on the list of fully protected species this season. These three have not shown the recovery noted in other species.

Last year's regulations not permitting baiting or the use of live decoys and sink boxes or batteries have been strengthened and continued.

Waterfowl and coot may be hunted in season from 7 a.m. to 4 p.m. standard time. The three-shell limit on repeating shotguns in effect last year is continued this season. Hunters may use shotguns not larger than No. 10 gauge. The 100-foot regulation for the location of blinds has been eliminated.

Drastic restrictions for waterfowl hunting this season in the Provinces have been adopted by Canadian authorities. The Canadian restrictions to a very large degree are commensurate with those for the United States. The open season on waterfowl in Canada has been reduced to two months with a daily bag limit of twelve ducks and five geese. Use of live decoys and baiting are also prohibited, and in certain Provinces the use of "sneak" boats will not be allowed.

"Only by restricting the kill," says the Biological Survey, "will it be possible to send more birds back to the newly created breeding grounds in this country and to the Canadian areas where breeding birds are still deficient. In addition to the reduction in the legal kill last year, the illegal kill by duck bootleggers and post-season violators has been substantially curtailed as a result of the activities of United States Game Management Agents, Federal under-cover men, and state game officials, aided by stiff penalties imposed upon the violators by Federal and state courts. These gains, however, are not great enough to justify any general let-up in the restrictions."

"This year's drought," continues the Survey, "has seriously affected the duck crop in the United States and emphasizes the need of continuing restrictions on waterfowl hunting."

The thirty-day shooting season for ducks, geese, Wilson's snipe (jacksnipe), and coot will open in the following northern States October 10: Maine, Michigan, Minnesota, Montana, New Hampshire, North Dakota, South Dakota, Vermont, and Wisconsin.

In the intermediate zone the season on

these birds opens November 1. States in this zone are: Arizona, California, Colorado, Connecticut, Illinois, Idaho, Indiana, Iowa, Kansas, Massachusetts, Missouri, Nebraska, Nevada, New Mexico, New York, including Long Island, Ohio, Oregon, Pennsylvania, Rhode Island, Utah, Washington, West Virginia, and Wyoming.

In the southern zone the season opens November 26. States in this zone are: Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, New Jersey, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia.

In Alaska north of the Alaska Range and the Ahklun Mountains the season will open September 1 and close on September 30; south of these mountains and west of the 141st meridian and east of False Pass at the tip of the Alaska Peninsula the open season is September 16 to October 15; in southeastern Alaska from the 141st meridian to Dixon's Entrance, October 1 to October 30; and islands of Unimak, Unalaska, Akutan, and Akun west of Unimak Pass in the Aleutial Island group, November 1 to November 30.

No open season is allowed on snow geese and brant in Florida and in states north thereof that border on the Atlantic coast, and on Ross's geese, wood ducks, ruddy ducks, canvasback ducks, redhead ducks, bufflehead ducks, and swans.

Regulations on bag and possession limits, continued from last season, place the daily bag limit on ducks at ten in the aggregate of all kinds and make the possession limit conform to the daily bag.

Bag and possession limits on geese and brant of the kinds permitted to be killed remain at four in the aggregate of all kinds.

The bag and possession limits on other species affected by the regulations are as follows: rails and gallinules (except sora and coot), fifteen in the aggregate of all kinds; sora, twenty-five; coot, fifteen; snipe, fifteen; woodcock, 4; doves, twenty; and band-tailed pigeons, ten.

HERDS IN SAN SIMON VALLEY

(*Continued from page* 457)

process might be. Nor were the stockmen wholly to blame. No one sounded a word of warning; none could foresee the rapidity with which these glorious ranges would pass out of the picture, victims of man's carelessness and lack of understanding.

About this time, in 1895, it was generally estimated that fully 50,000 head of cattle were grazing on the San Simon ranges. It was a situation reminding one of the man Mark Twain told about, who complained that "everybody talked about the weather, but nobody did anything about it."

A few years later the end was in sight and nearly all of the big San Simon outfits shipped their herds to eastern markets and went out of business. Since then the range has improved considerably as to forage, but the matter of erosion has grown by leaps and bounds until today the San Simon Valley is a shining example of what uncontrolled, unrestricted grazing will do to the best of ranges.

My last visit to the Valley was in the fall of 1934. Many of the old valuable grasses and forage plants were gone. The green meadows were replaced by wide expanses of drifting sand. Of running water, except during the summer rains when floods occurred, there was almost none. The ranges on both sides of the Valley—it is now called the Solomonville Wash—were criss-crossed with deep trails, first worn by the feet of the restless herds and then dug deep into the loose soil by the storm waters. On both sides of the main wash side washes headed into it from the mountain slopes, each doing its very best to drain off every drop of water that fell from the summer rains or came from melting snows on the mountains in the spring.

The lowering of the bed of the stream began almost at the head of the Valley, and for sixty miles, ending at the Gila River, the flood waters had scoured their way. Moreover, settlers living along the wash near its junction with the Gila found these floods were cutting away many acres of their farm lands. To meet this situation they attempted to straighten the stream by means of a long canal. The scheme was a grand failure. Instead of improving matters it made conditions worse. The flood waters came down faster, their scouring propensities were greatly increased, and in the end the huge "island" made by the canal was washed down stream to fill the irrigating canals and dams of the settlers lower on the Gila.

Where it entered the Gila River the San Simon wash was originally not more than ten feet wide. In 1935 it was fully a hundred feet wide, and thirty feet deep. In some places above the junction the San Simon today has widened out to more than two hundred feet.

Naturally, the first question to be answered is: Can this ruinous loss be stopped? Can forage plants and shrubs be brought back to once again cover and protect this and other like areas? Finally, can the damage already done be repaired?

The loss can be stopped, forage plants can be brought back, but only with time and proper methods of control and supervision. Nature works slowly in repairing such damage. A valley area that has been centuries in forming cannot be restored except through years of systematic control, supervision and rest.

The stockmen of Arizona, as well as those of most western states, are today facing a crisis that must be met with whole-hearted co-operation on their part with the government in managing these grazing areas so that they may be saved from greater destruction and restored to use.

Naturally, the thousands of acres of valuable farm and grazing land already washed away by the rivers of Arizona and deposited in the Gulf of California cannot be brought back. But there is no doubt that further losses can be stopped by means not beyond the professional ability of irrigation and erosion engineers.

As for the livestock business, that, too, can be taken care of. For over twenty-five years now grazing men and the scientists of the United States Forest Service have been working on this matter of grazing livestock in large numbers on the open ranges of the National Forests. It is an established fact, one that cannot be honestly denied, that but for the wise policies of the Forest Service in handling grazing on these public areas, every western mountain range, and the foothills below them, would today be in almost the same unfortunate shape that comparable mountain ranges in China have been for centuries past.

The present emergency offers a vast field for true national conservation. But remember this,—it will not be accomplished in a year, or a dozen years. And most of all, to succeed it will require conscientious cooperation by every stockman using these lands. In no other way will it be brought about.

In conclusion, the foregoing picture is not that of an isolated or unusual area. All over the West similar areas are now going through the same destructive process of erosion.

WITH THE TRAIL RIDERS OF 1936

(Continued from page 449)

Great Smoky Mountains Expedition, North Carolina and Tennessee, June 21 to July 2—Miss Lorena Coale, Cleveland, Ohio; Miss Louisa Finney and William Finney, Aberdeen, Maryland; Miss Edith Foster, Plainfield, New Jersey; Miss Gladys L. Hendrie, Brooklyn, New York; Miss Lillian M. Judd, Waterbury, Connecticut; Miss Marian W. Mair, Oneonta, New York; T. B. Saunders, Richmond, Virginia; Miss Besse Simpson, Cleveland, Ohio; Miss Lenore Suder, Chicago, Illinois; and Lukas Zimmerman, Detroit, Michigan. The party was under the direction of G. H. Collingwood, forester for The American Forestry Association; Thomas Alexander, of Asheville, North Carolina, was chief packer.

Flathead-Sun River Expedition, Montana, July 9 to July 20—Miss Mable Abercrombie, Knoxville, Tennessee; David Beals, Kansas City, Missouri; Miss Frances M. Benson, Pittsburgh, Pennsylvania; Miss Carolyn Bowen, Marshall, Michigan; Miss Jeanette Bowen, Storrs, Connecticut; Miss Mary Downing, Kansas City, Missouri; Miss Janet Fish, Windsor, Connecticut; Miss Marjorie Fish, Boston, Massachusetts; Miss Edna Goss, San Jose, California; Miss Helen Hollander, Amesbury, Massachusetts; Mr. and Mrs. E. J. McWhirter, Seattle, Washington; Miss Edith Mason, Hathorne, Massachusetts; Miss Sue E. Sadow, New York City; Miss Byrde Salsbury, New Haven, Connecticut; Miss Ida Sandman, New York City; Arthur C. Vicary and Miss Louise Vicary, Erie, Pennsylvania; and Miss Marian Wayave, Washington, D. C. Ovid Butler, Executive Secretary of The American Forestry Association, was director of the expedition; Joe Murphy, Ovando, Montana, was chief packer; Dr. Charles R. Thornton, Missoula, Montana, was medical officer.

Wind River Wilderness, Wyoming, July 30 to August 10—Miss Anna R. Armstrong, Rutherford, New Jersey; Misses Clara and Elizabeth Falconer, Shaker Heights, Cleveland, Ohio; J. T. B. Bogardus, New York City; Miss Mary Downing, Kansas City, Missouri; Miss Barbara Fison, Hamden, Connecticut; Arthur Hutchinson, Chester Springs, Pennsylvania; Miss Margaret Loughran, Jackson Heights, New York; Roberts Mann, Chicago, Illinois; Miss Alexandria Moleske, Hanover, New Hampshire; Miss Elizabeth Moore, St. Louis, Missouri; Miss Grace Morris Price, Pittsburgh, Pennsylvania; William L. Robinson, Mt. Vernon, Ohio; Miss Ruth Smith, Denver, Colorado; and Miss Marian Wayave, Washington, D. C. G. H. Collingwood, Forester for The American Forestry Association, was director of the expedition; Stan Decker, of G. P. Ranch, Cora, Wyoming, was chief packer; Lieutenant Robert L. Callison, Fort Warren, Wyoming, was medical officer.

Gila Wilderness, New Mexico, August 1 to August 13—Miss Edna Boyce, Washington, D. C.; Miss Dorothy Gebauer, Austin, Texas; Miss Marjorie Hester, Santa Barbara, California; Dr. Charles Oderr, Westfield, New Jersey;

TRAIL MULE

ETHEL DIETER

Agate and Marble and Cannonball,
Blinkin' their eyes in the canyon corral,
Laughin' at tenderfeet ready to ride
With half-hearted grins and weakinin' morale,
Were wise in their knowledge of treacherous places
Of narrow trails and wind-dusted spaces.

But Agate and Marble and Cannonball
Jest put out their feet and lifted 'em tall,
And the sighs that they heaved as they started the trip,
Tantened the cinch 'till it threatened t' rip.

They plodded their slow-treadin' pace down the gorge,
Hangin' their sleepy heads over the rim,
'Till every heart mounted flew up with a gulp,
And leather grew slipp'ry and smiles grew dim,
And the horn of the saddle seemed a mighty fine tool
On the Bright Angel Trail aridin' a mule.

But Agate and Marble and Cannonball
Jest put out their feet and lifted 'em tall,
And they cautiously turned with languishing ease
Nippin' at grass and weathered scrub trees.

But it wasn't long 'fore every eye on the trail
Was raised to the cliffs and the sage and the pine,
And the women were starin' with a fancyin' gaze
At the handsome young man aheadin' the line:
And romantic, fool notions of a ranch in the West,
Were poundin' in many a feminine breast.

But Agate and Marble and Cannonball
Jest put out their feet and lifted 'em tall,
And the thought in their heads that clamored real loud,
Was a bed full of hay adrift on a cloud.

But soon there was startin' a shiftin' of seats,
A stretchin' of legs and an achin' all over,
And a longin' inside of each tenderfoot grew
For the end of the trail and a field full of clover;
And prayers they were answered by the All-Mighty Giver,
Around the next bend, and there was the river!

But Agate and Marble and Cannonball
Jest put out their feet and lifted 'em tall,
And the silvery waters of sweet springs and creeks
Splashed over fetlocks and laughed at peaks.

There was singin' and talkin' and laughin' real loud,
Back on the way to the rim a mile high,
And nary a heart took a turn for the worst,
When the trail started headin' right straight for the sky;
And down in the Canyon a thousand ' so feet,
The shadows were lengthenin', preparin' for sleep.

But Agate and Marble and Cannonball
Jest put out their feet and lifted 'em tall,
And the click of their hoofs on the loosened stones,
Rattled and clattered melodious tones.

Misses Louise and Clara Otto, Saginaw, Michigan; Miss Margaret Peck, Austin, Texas; Miss Jessie L. Saunders, San Francisco, California; Misses Bertha and Grace Schroeder, Chicago, Illinois; Gustave A. Leins and G. Robert Leins, Philadelphia, Pennsylvania; and Miss Anita Tucker, Wheaton, Illinois. Erle Kauffman, Director of Education for The American Forestry Association, was in charge of the party; G. W. Evans, Beaverhead, New Mexico, was chief packer.

Olympic Wilderness, Washington, August 13 to August 26—Miss Katharine Burr, Washington, D. C.; Miss Gertrude Chesnut, Hyattsville, Maryland; Miss Ellen G. Conley, Chicago, Illinois; Miss Marjorie Fay, Chicago, Illinois; Mrs. L. F. Gates, Wilmette, Illinois; Joseph O. Grove, St. Paul, Minnesota; Mrs. Fred E. Hornaday, Washington, D. C.; A. H. Hutchinson, Chicago, Illinois; Miss Grace R. Johnson, Washington, D. C.; Miss Katharine E. Kovar, New York City; Miss Janet Virginia Lee, Wilmette, Illinois; Miss Margaret Loughran, Jackson Heights, New York; Henry M. Lucas, Cleveland Heights, Ohio; Hugh McClellan, Wichita, Kansas; Miss Helen Moreau, Chicago, Illinois; Miss Clara Noerenberg, Spokane, Washington; Mr. and Mrs. Carl Stifel, St. Louis, Missouri; Mrs. Dwight Taylor, Washington, D. C.; and Edgar H. Wolfe, Chicago, Illinois. Fred E. Hornaday, business manager of The American Forestry Association, was in charge of the expedition; R. E. Voorhies and Ignar Olson, of Quinault, Washington, were chief packers; Dr. Alex E. Fairshter, of Port Angeles, Washington, was medical officer.

MUST THEY STARVE?

(*Continued from page* 465)

died by the hundreds last winter in their barren ancestral yard, within a day's travel of a land of plenty.

On one point Michigan sportsmen and conservationists appear determined and pretty much of one mind. They want no doe shooting.

Michigan hunters have been trained for decades to believe that doe shooting is anything but sportsmanlike. The buck law is by no means perfectly observed and the annual illegal slaughter of does is heavy. Nevertheless, the decent sportsmen of the State brand a doe killer as beneath contempt. Such sentiment is not changed overnight.

Much of the support for Michigan's whole program of wildlife conservation rests on this tradition and any suggestion to undermine it musters little support.

Doe shooting cannot be turned off and on with a spigot. The minds of hunters in the aggregate do not work that way. Those who oppose any doe shooting fear that once begun it would free a landslide of illegal deer killing and other game law violations that would constitute a major threat to the wildlife resources of the State.

All in all there is a headache of major proportions in the Michigan deer problem, and State conservation officials are beginning to wince at its first twinges. Deer hunting is an industry in a State that licenses nearly 100,000 hunters each year, an important industry not to be ignored.

All signs indicate that the winter range is no longer adequate for the herd. Behind lie the sorry examples of Pennsylvania, the Kaibab, Jackson Hole and lastly Isle Royale. Ahead, unless the signs fail, lies tragedy on a wide scale.

On one side are State game men, with real and honest fears for the future. On the other side are sportsmen and conservationists, with equally honest determination to keep the buck law that has meant the salvation of deer hunting these many years.

And in the middle are the whitetails themselves, hundreds of thousands of them, drifting in from their summer pastures when the December snows come, to cedar swamps eaten out and self-pruned, to yarding areas that supply less browse with each passing winter.

Is starvation eventually to be the fate of a tenth or a quarter or a half of the great herd?

UNCLE SAM BUYS SOME FORESTS

(*Continued from page* 446)

ment relief conditions which were established by the forest acquisition program compared to the conditions which otherwise would have prevailed, reduces the true cost of the forest purchases to fully justifiable proportions.

Another aspect of the forest purchase policy was the alleviation of economic depression. As private assets the lands too frequently were frozen, but the cash paid for them was liquid and would circulate with considerable velocity. Much of it went into county treasuries in settlement of long delinquent taxes, since the government would not accept title until all such taxes were paid. Much of it was used to meet payrolls and thus continue industrial operations that otherwise would have been suspended. Some part of the funds paid for lands was used for industrial betterments; some for settlement of long standing obligations. Grounds exist for the assumption that the Federal disbursements for lands carried a certain by-product of economic relief for which public expenditures otherwise would have been necessary.

On May 20, 1933, President Roosevelt allotted $20,000,000 of emergency funds for purchases of lands under the Weeks Law; four-fifths as much as the entire amount appropriated for that purpose during the preceding twenty-two years. The four new members of the National Forest Reservation Commission and the three veteran members, alike in their desire to carry the program forward without delay, gave liberally of their time and constructive thought to that end. With their encouragement and support the Forest Service expanded its acquisition organization and extended its studies into new fields. Time was of the essence, but without sacrifice of desirable principles, procedures and safeguards to the public interest.

Fortunately much preparatory work had been done. For years that genius of forestry, the late W. W. Ashe, painstakingly had made personal studies and analyses of forest conditions in the Appalachian region and the southern pine belt; his efforts later being supplemented by those of other investigators. In consequence, many of the areas in which Federal forest ownership and management strongly was dictated by preponderant circumstances tentatively had been defined and much of the data required for decision and action had been compiled. The plans of purchase that took form were neither casual nor exigent.

Within the year twenty-eight new purchase units were established. These were: the Green Mountains North, in Vermont; the Clinch, in Virginia; the Sauratown, Uharie and Croatan, in North Carolina; the Enoree and Long Cane, in South Carolina; the Apalachicola, in Florida; the Holly Springs, Bienville, Chickasawhay, Leaf River and Biloxi, in Mississippi; the Angelina, Davy Crockett, San Jacinto and Sabine, in Texas; the Clark, Fristoe, Gasconde, Pond Fork, Gardner and Wappapello, in Missouri; the Illini and Shawnee, in Illinois; the Manistee, in Michigan; the Chippewa, in Minnesota, and the Toro Negro, in Puerto Rico. A number of the previously established units substantially were enlarged. At the close of the fiscal year 1934, the total number of established purchase units was sixty-nine, situated in twenty-three of the states east of the Great Plains, their boundaries including a gross area of 34,018,609 acres. In the same year 4,206,817 acres were approved for purchase, almost as much as during the entire period from 1911 to 1932. In consequence, the Federal Government controlled within the purchase units a total of 12,068,692 acres; of which 2,227,395 acres had been reserved from the Public Domain, 252,418 acres acquired through exchanges, and 9,588,879 acres purchased or in course of purchase.

The following year marked a further extension of the purchase program, into twenty-three new areas and four additional states. These were: the Conecuh, Oakmulgee, Talladega and Tombigbee, in Alabama; the Mountain Lake, in Virginia; the Pleasant Run, Lost River and Lafayette, in Indiana; the Keosauqua, Chequest, Chariton and Grand River, in Iowa; the Muskingum, Hocking Valley, McArthur, Little Scioto and Symmes Creek, in Ohio; the Souris and Sheyenne, in North Dakota; the Gogebic, in Michigan, the Delta, in Mississippi; and the St. Francois and Table Rock, in Missouri. Of previously established units, nineteen were materially enlarged. Through these actions the total of the purchase units had mounted to eighty-four, situated in twenty-seven States east of the Rockies, and in Puerto Rico. The gross area within their boundaries was 48,130,805 acres; of which 16,954,402 acres was in Federal control; this consisting of 3,753,433 acres of reserved public lands, 253,756 acres acquired through exchange and 12,947,213 acres purchased or in course of purchase.

This acceleration of the purchase program had been made possible through the allotment by President Roosevelt of additional funds for that purpose. The original allotment of $20,000,000 had been supplemented by $10,000,000 through Executive Order of December 1, 1934, and by $13,750,000 through four Executive Orders or allocations in 1935. It was also made possible by the increasing number of states which had granted consent to Federal forest land purchases within their borders or defined parts thereof; thirty-four states and Puerto Rico having given such consent by the end of the fiscal year 1935.

The Grand Lake area, in Maine, two Redwood areas in northern California, two flood-control areas in Utah, and one in Idaho, were established in the fiscal year 1936. Meanwhile certain adjustments had been made in boundaries of previously approved units. At the close of the year, there were eighty-eight formally established purchase units in thirty of the states. Their boundaries included a gross area of 52,361,045 acres; of which 10,223,530 acres was classed as non-purchasable because of higher values for purposes other than forestry. In these units the reserved public lands aggregate 2,452,259 acres; the lands acquired through exchange 255,776 acres; the lands acquired or in process of acquisition, 15,695,528 acres. These lands are situated in seventy-six of the purchase units; there being eleven in which no purchases thus far have been approved. The disbursements and obligations in payment for lands total $58,815,077. To place in Federal ownership the remaining lands essential to the fruition of these purchase units will require further purchases of approximately 23,734,000 acres, at an approximate cost of $120,000,000.

Thus, the concept of thirty-seven years ago, the legislative pronouncement of a public policy twenty-five years ago, has become a substantial reality, a permanent principle of national action. The beneficial consequences thoroughly justify the Silver Jubilee celebration of the passage of the Weeks law; they will more fully justify the celebration of a Golden Jubilee in 1961.

AFTER THE FLOODS

(*Continued from page* 448)

existing national policies with respect to the major interests involved.

A recent attempt to deal comprehensively with the interlocking water and land problems of an entire river basin may be noted at this point. A concrete plan for the development and control of the water resources of the drainage area of the Red River of the North, together with a specific program for carrying the plan into effect, has been formulated by a Tri-state Committee representing Minnesota, North Dakota and South Dakota, with the technical assistance of consultants furnished by the National Resources Committee at the request of the states. This water plan, based on months of intensive study and on special investigations made in earlier years, is closely integrated and effectively balanced. It provides not only for flood control but also for such diverse but interrelated matters as abatement of stream pollution, control of low waterflow, improvement of municipal and rural water supplies, protection against grave distress from future droughts, enhancement of recreational values in natural lakes, wildlife conservation, and promotion of the utility of water for power development, all in the common interest of the people of the basin regardless of state lines. It takes closely into account not only the present water requirements of the area but also its prospective needs as judged by probable changes in population, land use, industry, and the like.

"Here for the first time," said Secretary of the Interior Ickes, "we have some specific proposals for coordinated water use which will mitigate drought distress and bring other manifest benefits to a large area. The program is an excellent example of the adjustment and reconciliation of the opinion of individuals, states, and even competing interests when energies are directed toward a common objective."

Some of the projects that make up the plan have been carried to the construction stage, others relate to the completion of surveys, and still others call for necessary surveys not as yet undertaken.

The national drainage basin study which the Water Resources Committee of the National Resources Committee now has underway in cooperation with other Federal agencies and with state and local agencies, and

upon which it is to report to the President on December 1, has three major objectives:

First is to indicate the outstanding water problems in the various drainage areas of the country; second is to outline broadly an integrated pattern of water development and control; and third is to present specific construction projects and investigation projects as elements of the integrated plan, with priorities of time and importance. This study supplements and extends the work of the Mississippi Valley Committee of the Public Works Administration and the Water Planning Committee of the National Resources Board. With respect to most basins the forthcoming plan doubtless will contain relatively few construction projects, because of lack of essential data. It obviously cannot be a fixed or final plan. No long-term plan for any drainage area could be formulated, even were all requisite hydrologic data available, which would not presently need modification because of unforeseeable events and developments. It is hoped, however, that the drainage basin study in progress may result in a significant contribution to the framework of an enduring, but adjustable, national water plan.

Despite the tragic losses inflicted by the merciless floods of last spring, they will have served a highly useful purpose if they help to make the people of the humid East water-minded. Frequently one hears or reads the statement that the soil is our greatest asset. Obviously, however, soil has no productive value without water. Lack of water, not of soil, ultimately will limit the capacity of the country as a whole to produce food and support life. Even now the further development of large areas, in the humid East as well as in the arid West, depends in considerable part on the extent to which the supply of water available for various purposes can be increased. Much has been done by Federal, state, and local agencies to promote the efficient use and effective control of water, especially in recent years. Vastly more remains to be done. The public should see that the task is accomplished, however long and difficult it may be.

RAVEN'S NEST

(*Continued from page* 455)

pulled away and Brockway plunged downward. Through rare presence of mind, he quickly turned his foot in such a way that it caught in the loop of the rope, stopping him suddenly, and leaving him suspended, head downward, fifty feet above the rocky base of the cliff. Stanley was too excited to snap the picture.

Brockway was unable to pull himself up; nor was Stanley, who climbed down and offered assistance, able to help him. Minutes seemed ages. The brief but maddening period was beginning to wear on Brockway. He was becoming dizzy from hanging in this inverted position. Something had to be done! But what?

Delay might be fatal—as might, also, any other course they should decide upon. Whatever method they adopted could, at best, be but a chance, and a slim chance at that. Hastily, one possible solution after another was considered, only to be discarded as hopeless.

The only plan that seemed to hold any ray of hope was to cut one strand of the rope, and in sheer desperation this was done. Instantly Brockway plunged downward, the fall being broken only slightly by a single bump against the side of the cliff.

The result appeared inevitable. How could a man survive such a fall? Stanley was horrified. He knew he must go as quickly as possible to the rescue. To force his way through the rhododendron around the side of the bluff would be the safest way, but that would take too much time. Completely ignoring the danger to himself, and thinking only of getting at once to Brockway's side, Stanley slid down the single strand of rope that remained. He had figured that the rope should now reach almost to the ground at the base of the cliff—but just how close he did not know. In his haste he did not even take time to go down "hand-under-hand," but slid like a streak of lightning. After recovering from the shock he received upon landing, he learned that he had dropped twenty feet.

His only thought was of Brockway's condition, and he felt that he knew, without looking, what the result would be. How could it be otherwise? How, they do not know, but it was otherwise. Brockway was stunned, badly bruised and lacerated. But to the utter amazement of both, there were no broken bones. Brockway had landed on his massive shoulders, and rolled down the steep slope before finally stopping. Stanley, landing on his feet, also rolled down the side of the mountain and thus escaped serious injury.

Brockway was too badly shocked to feel the pain that his body must have suffered. For Stanley, the situation was serious. It was his responsibility to get himself and his almost helpless companion out of this wilderness. A May sun was sinking rapidly behind the forest-clad ridge that rose high above them to the west. Hours of difficult hiking, even for able-bodied men, lay between them and their car at Gatlinburg.

The untrailed route down the turbulent mountain stream was a challenge to the best of hikers. They had to alternate often from pushing through almost impenetrable rhododendron to climbing over and around the boulders, or even wading the stream, with its slick rocks and deceptive pools. It seemed almost too much for them, but there was no alternative and they had to go on, if they could.

Brockway had regained use of his body only sufficiently to stand, but not even enough to walk without assistance. His 200 pounds would have been a burden to his 140-pound companion on an open trail, and this was far from an open trail, or a trail of any description. They plodded slowly and tortuously along for short distances, then Brockway would sit down and wait while his brave companion went ahead, through the inky darkness, to seek out a passable route. He then retraced his steps and proceeded back over the route with his crippled friend.

If Stanley could only have gone down to Gatlinburg for help, the problem would have been much simplified. But, Brockway was in no condition to be left alone on the mountainside, especially since May nights are quite cool in the Great Smokies. He had to fight it out. It was a tedious process, but it was the only way out.

A horse, borrowed from the first house in the foothills, made the last few miles of the trip to Gatlinburg a bit easier and quicker, but the sun was rising over the majestic peaks of the Great Smokies as Brockway was taken into the emergency room at the Fort Sanders Hospital.

It was a badly swollen and lacerated face that greeted his friends that morning. But it was a happy one. The pride of accomplishment registered uppermost. Had he not found the first nest in the Great Smokies of the rare northern raven?

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Index to

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October, 1936

PAGE

American Fork and Hoe Company 472
American Telephone and Telegraph Company ..... 2nd Cover
Army and Navy Supply Company 483
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Bartlett Manufacturing Company 480
Beebe Brothers 481

Chalfonte-Haddon Hall 478
Cutter Shoe Manufacturing Company, A. A. 485

Du Pont de Nemours & Company, Inc., E. I. 473

Ever-Set Trap Company 474

Fechheimer Brothers Company, The 482

Gardeners' Chronicle 478
Good Roads Machinery Corporation 477

Herbst Brothers 479
Hough Company, Romeyn B. 478

Idaho School of Forestry 484
Indian Museum 485
International Harvester Company, Inc. 471

Jaeger Machine Company, The 481

Keene Forestry Associates 480
Kelsey Nursery Service 480

Loring, J. Alden 483

Maine School of Forestry 482
Mayflower, The 475
Mears, A. H. G. 482

Neuhart, A. L. 485
New York State College of Forestry 474
Nut Tree Nurseries 480

Oberlin Peony Gardens 485
Out Door Store, Inc., The 485

Peat Import Corporation 476

Smith & Company, D. B. 479-482
Stoeger, Inc., A. F. 483

Tuller Hotel 484

Western Maine Forest Nursery 480
Woolrich Woolen Mills 483

MASTER BULLFROG

(*Continued from page* 467)

and females attaining generous proportions. The male has large ears; both sexes have broad, flat heads. A noticeable amount of variation has been recorded for these frogs over their wide range in different areas of the United States, stretching from the upper Atlantic seaboard to Florida, then westerly north and south to the Rocky Mountains. There is a smaller type listed as the southern bullfrog mentioned for Florida, Mississippi and elsewhere, an individual more beautiful, more slender, of more variety in color than its larger prototype. In fact, it has small resemblance to its stouter cousin; its notes are far different, having been compared to the grunting of a company of pigs.

The northern bullfrog, inhabiting the country east of the Rockies, is decked out with an upper coat of green or greenish brown, which may be of a deep or paler tone. The shade does not always continue the same with the same frog; possibly the changes noted may be caused by weather conditions or by circumstances unknown to human students. While some bullfrogs have clear, unspotted upper garbs, dusky marks appear on other amphibians, marks also varying from almost indistinct to very sharply defined patterns. Most frogs have dusky bars on their legs, while the undersurface of the body is white, more or less clearly or obscurely decorated with mottlings and spots of dusky shade.

Since the meadow-green frog is similar in costume to the bullfrog, these distinguishing marks should be kept in mind. In spite of changes and differences, the male and female green-frog ordinarily present on much of their head and shoulders a distinct bright metallic green, and there is no such brilliance in the bullfrog's garments. There is also likely to be exhibited by the green-frog a stripe of yellow on the jaws and shoulders; the bullfrog has no such characteristic. Male green-frogs have deep orange-yellow throats; the female a white throat flecked with dark spots. It is much smaller than the bullfrog, males seldom reaching more than three and a half inches and very large females not over five inches. The green-frog is trimmer, more alert appearing than its bulky relative.

In the autumn, bullfrogs burrow into the mud of pond or stream to remain for the winter hibernation. While green-frogs may come out of hibernation for a brief spell during some genial winter days, the bullfrog is a steady sleeper, according to most observers, waiting until May before venturing out of his muddy couch.

In May and June, perhaps as late as July, the eggs of the bullfrog are consigned to the water for the incubating process; then, unlike so many toads and frogs, it is not until the second year the tadpoles leave the tadpole life to become completely developed frogs. Hence these tadpoles are favorites as denizens of aquariums.

Tadpoles—called by boys and girls "pollywogs"—are dusky creatures, ever rushing to the surface of the water for a "breath of fresh air." When they assume complete frog estate nature provides a body able to remain submerged for extended periods without being forced to the upper atmosphere. The tadpole has a list of formidable foes, in spite of the tail aiding him to dart rapidly when pursued by some of them. Millions of his kind are preyed upon.

As weeks vanish—months in case of the bullfrog—the long tail of the tadpole is absorbed, hind legs appear, then the arms or forelegs, the head grows to proper conformation, and another frog is ready to occupy a place among his fellows.

WHO'S WHO

Among the Authors in This Issue

L. F. Kneipp

L. F. KNEIPP (*Uncle Sam Buys Some Forests*) is an assistant chief of the Forest Service, in charge of Land Acquisition and Land Use Planning activities. Beginning his official work at the age of nineteen as a Forest Ranger in Arizona, he has since served as Forest Supervisor of what are now the Carson and Santa Fe National Forests in New Mexico, as assistant forester in the Branch of Grazing and as Regional Forester in charge of the Intermountain Region from 1915 to 1920, when he undertook his present work.

CARLOS C. CAMPBELL (*Raven's Nest*) is a member of the Board of Directors of the Great Smoky Mountains Conservation Association, the organization which was instrumental in establishing the Great Smoky National Park. He is an enthusiastic hiker and outdoorsman, with a special interest in trees, wild flowers and photography.

WILL C. BARNES (*Herds in San Simon Valley*), author, rancher and grazing expert, was for fourteen years assistant forester in charge of the Branch of Grazing of the Forest Service. Resigning in 1929, "because the pioneering work in range management had been done," he became secretary of the United States Geographic Board, and later, after a world tour, returned to Arizona to complete a series of books.

HARLAN H. BARROWS (*After the Floods*) is professor of Geography at the University of Chicago and is co-author of several books on geography. He is a member of the Association of American Geographers, of which he was president in 1922, and a member of the Swedish Society for Anthropology and Geography.

Harry E. Miller

HARRY EDWARD MILLER (*Field and Forest for Boys and Girls—"Master Bullfrog"*), of Stratford, Connecticut, has been a life-long student of the out-of-doors, starting nature studies of his own before he was ten years of age. His articles on nature have been published in various American papers and magazines, and for the past twelve years Mr. Miller has been gathering data relating to the distribution of venomous serpents in northeastern United States and eastern Canada.

BEN EAST (*Must They Starve?*) is Nature Editor of a chain of eight Michigan daily newspapers published in Bay City, Saginaw, Flint, Ann Arbor, Jackson, Kalamazoo, Grand Rapids, and Muskegon. Last year two of his articles on the starvation of Isle Royale moose appeared in AMERICAN FORESTS.

ETHEL DIETER (Poem—"*Trail Mule*"), of New York City, wrote this poem as a result of a trip across the continent in a motorbus last year. Miss Dieter has two of her poems included in the anthology, "The Year Book of Contemporary Poetry, 1936."

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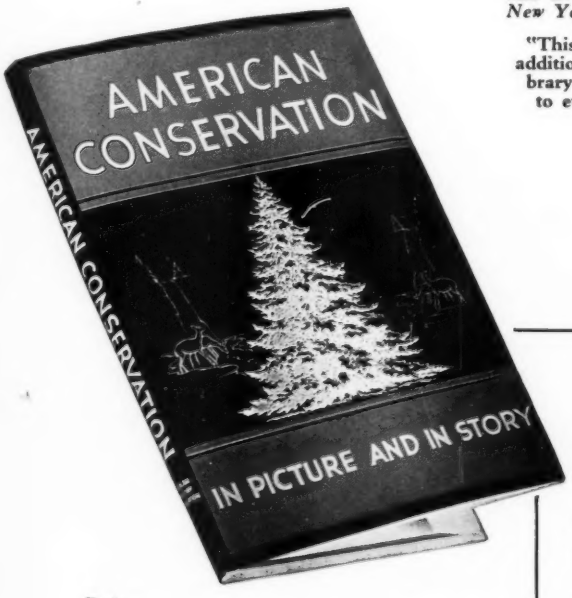

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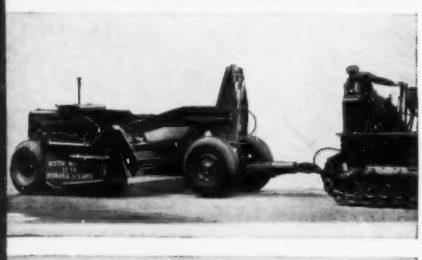

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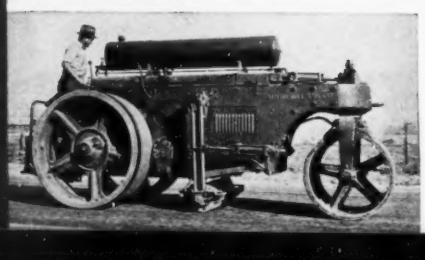

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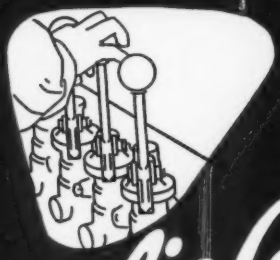

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